Beachlands Wastewater Scheme Discharge

Resource Consent Application and Assessment of Environmental Effects

June 2024

Ref: 310104130

PREPARED FOR:

Watercare

PREPARED BY:

Stantec

Stantec

Revision Schedule

Revision No.	Date	Description	Project Manager Final Approval
1	6 June 2024	Final	Mark Wollina

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Application Form

APPLICATION FOR RESOURCE CONSENT UNDER SECTION 88

OF THE RESOURCE MANAGEMENT ACT 1991

To: Auckland Council

1. Watercare Services Ltd., 73 Remuera Road, Remuera, Auckland 1050 applies for the following type of resource consent:

   Discharge permit.

2. The activity to which the application relates (the **proposed activity**) is as follows:

   The discharge of treated wastewater from the Beachlands Wastewater Treatment Plant, via an overland flow system, to a tributary of the Te Puru Stream, and to groundwater.

3. The site at which the proposed activity is to occur is the Beachlands Wastewater Treatment Plant (owned by Watercare Services Limited) at 100 Okaroro Drive, Beachlands and legally described as Lot 8, DP 153965 and Lot 1, 157365.

4. The full name and address of each owner or occupier (other than the applicant) of the sites to which the application relates are as follows:

5. Watercare owns the application site including the proposed discharge location (tributary of the Te Puru Stream).

6. The other activities that are part of the proposal to which the application relates, including any permitted activities, are described in section 4, Beachlands Wastewater Scheme Resource Consent Application and Assessment of Environmental Effects, June 2024.

7. The following additional resource consents are potentially needed for the proposal to which this application relates and have not been applied for:

   a) Regional land use consent for activities associated with the construction of the upgraded and new wastewater treatment plant and extended overland flow system.

   b) Land use consent required under the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health.

   c) Any consents required under the National Environmental Standard for Freshwater.

8. Attached are:

   Beachlands Wastewater Scheme Discharge - Resource Consent Application and Assessment of Environmental Effects, June 2024

   Stantec - Beachlands Wastewater Scheme Resource Consent Project - Alternatives Assessment Report, June 2024

   Streamlined Environmental - Beachlands Wastewater Treatment Plant – water quality, ecological and human health effects assessment

   Pattle Delamore Partners (PDP) – Beachlands WWTP: Preliminary assessment of land area requirements for overland flow system explanation – Memorandum 1

   PDP – Beachlands WWTP: Assessment of Overland Flow System Treatment Performance – Memorandum 2.

   PDP – Beachlands WWTP: Assessment of Overland Flow System Treatment Performance – Memorandum 3 (interim)

   PDP – Assessment of Potential Effects on Soils and Ecology from Beachlands WWTP Overland Flow System (Memorandum 4)

   PDP – Beachlands Maraetai WWTP Resource Consent Renewal: Stream Hydraulic Assessment

   NIWA – Beachlands WWTP Discharge: Assessment of microbiological effects and health risk

   DHI Water & Environment Ltd (DHI) – Assessment of Proposed Te Puru Stream Discharge

   Bioresearches – Water Quality and Biological Assessment, Te Puru Stream Tributary, Beachlands

   Bioresearches – Te Puru Stream WWTP Discharge Assessment of Effects on Stream Habitat

Beachlands WWTP – Wastewater Discharge Consent Project – Stakeholder Engagement Report, May 2024

which contain assessments of the proposed activity's effect on the environment that:

a) includes the information required by clause 6 of Schedule 4 of the Resource Management Act 1991; and

b) addresses the matters specified in clause 7 of Schedule 4 of the Resource Management Act 1991; and

c) includes such detail as corresponds with the scale and significance of the effects that the activity may have on the environment.

9. Beachlands Wastewater Scheme Discharge - Resource Consent Application and Assessment of Environmental Effects, June 2024 referred to in 8. above which contains an assessment of the proposed activity against the matters set out in Part 2 of the Resource Management Act 1991.

10. Beachlands Wastewater Scheme Discharge - Resource Consent Application and Assessment of Environmental Effects, June 2024 referred to in 8. above which contain assessments of the proposed activity against any relevant provisions of a document referred to in section 104(1)(b) of the Resource Management Act 1991, including the information required by clause 2(2) of Schedule 4 of that Act.

11. No further information is required to be included in this application by the district plan, the regional plan, the Resource Management Act 1991, or any regulations made under that Act.

12. A term of 35 years is sought for the resource consent.

Date: 07 June 2024

Tanvir Bhamji

Resource Consenting Manager

Signed on behalf of Watercare Services Ltd

Electronic Address for Service: Tanvir.Bhamji@water.co.nz

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Contact Person: Tanvir Bhamji

Executive Summary

Watercare Services Limited (Watercare) is a lifeline utility providing water and wastewater services to 1.7 million Aucklanders every day. Its services are vital for life, keeping people safe and helping communities to flourish. Watercare's activities and programmes are funded through user charges and borrowings. Watercare is required by the Local Government (Auckland Council) Act 2010 to be a minimum-cost, cost-efficient service provider.

Watercare is seeking to replace the current resource consent it holds for the discharge of treated wastewater from the Beachlands Wastewater Treatment Plant (**WWTP**). The current discharge consent has a maximum daily discharge volume limit of 2,800m³/day and expires on 31 December 2025.

Like much of Auckland, the service area of the WWTP is subject to significant growth which is beyond the current capacity of the existing WWTP. In addition, the existing WWTP is coming to the end of its design life and several components need to be upgraded or replaced.

The proposal will enable the servicing of future growth including under a recently allowed plan change and a proposed business park. Both these developments originally included individual wastewater treatment and discharge solutions. This application will enable the reticulation of the wastewater from these new developments to the WWTP for treatment and discharge. It will result in only one discharge to the environment, rather than three, and ensure the consistent and effective management of the community's wastewater by a highly competent and experienced operator.

The proposal is to discharge treated wastewater from the WWTP, via an overland flow system, to a tributary of the Te Puru Stream and to groundwater for a term of 35 years. There are 4 stages to the proposed discharge: first, a short-term continuation of the discharge from the current WWTP; second, discharge following a Short-term upgrade to the WWTP; and discharge following the replacement of the WWTP with a new MBR WWTP (Long-term Stages 1 and 2). The timing of the replacement of the WWTP will be triggered by discharge flow rate, based on a population equivalent (PE). The new MBR WWTP will raise the level of treatment of wastewater from the Beachlands and Maraetai communities to the very high standard that Watercare provides elsewhere in Auckland. A term of 35 years is being sought, covering the 4 stages noted above.

Under the proposal, during all 4 stages treated wastewater will continue to be discharged, via an overland flow system, to groundwater and the current farm pond which is located within a tributary of the Te Puru Stream. During the term of the proposed consent, the overland flow system would be expanded to accommodate the forecasted increase in discharge volumes. The current farm pond may also need to be upgraded to accommodate increased flows.

A comprehensive suite of technical investigations and assessments have been undertaken to support the resource consent application.

An assessment of environmental effects (AEE) has been prepared and takes into account these technical assessments. This document identifies the potential for adverse effects in relation to the discharge of treated wastewater to land, on Te Puru Stream and on the coastal marine area.

With respect to the discharge to land, the AEE identifies that adverse effects may potentially arise in relation to terrestrial ecological values and groundwater quality. The AEE concludes that any such adverse effects will be very low given proposed design and operational measures.

With respect to effects on Te Puru Stream, the AEE evaluates potential hydrological impacts, potential effects on the water quality of the stream and potential effects on stream ecology. It identifies that the level of these adverse effects will range from negligible to potentially moderate (when considered in the combination with other catchment stressors). Further, relative to the current state, the proposed improvements in the treated wastewater quality will result in material improvement to several stream attributes.

Finally with respect to potential adverse effects on the coastal marine area, the AEE evaluates potential effects that may arise due to salinity, nutrients and microbiological contaminants. The AEE identifies that due to dilution and the proposed treatment improvements such effects will be negligible to low.

Ongoing engagement is occurring with Ngāi Tai ki Tāmaki on the proposal and its effects on their values. Their input to date has helped to guide the development of the preferred option.

The proposal will also result in a range of positive effects These include the provision of a safe and reliable public health sanitation system for the community and the facilitation of future development within the community.

The detailed statutory assessment completed for this application concludes that the proposal is generally consistent with the relevant planning instruments and Part 2 of the RMA. It further concludes that the potential adverse effects identified in section 107 (1) (c) to (g) of the RMA are unlikely to occur as a result of the proposed discharge.

Watercare has proposed a range of management, mitigation and monitoring measures that it considers will ensure the proposal remains appropriate over the 35 year consent term being sought. These include:

- Short-term and Long-term WWTP upgrades to ensure high quality treated wastewater.
- Progressively stricter compliance limits for discharge volumes and treated wastewater quality that reflect staged upgrades to the WWTP.
- Wastewater and receiving environment water quality and ecology monitoring.
- An Environmental Management Plan to integrate operational management and maintenance, treated wastewater and environmental monitoring and reporting.
- The preparation and implementation of an Overland Flow Design and Operational Management Plan.
- Riparian planting within the Watercare site boundary.
- Ongoing community consultation through the establishment of a Community Liaison Group.
- Regular monitoring and technology reviews.

In addition, Watercare is continuing to work with Ngāi Tai ki Tāmaki to understand the effects of the treated wastewater discharge on Te Taiao, Te Puru Stream and its tributaries, and Ngāi Tai ki Tāmaki's special connection to these, and to develop additional mitigations and remedies to assist in addressing these effects. Watercare is continuing to engage with Ngāi Tai ki Tāmaki throughout the project and Watercare has committed to support them in the development of a Cultural Impact Assessment.

For these reasons Watercare considers that the discharge permit should be granted for period of 35 years and subject to conditions reflecting the measures proposed in Section 10 of this application.

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Abbreviations

Abbreviations	Full Name
ADF	Average Daily Flow
AEE	Assessment of Environmental Effects
AMP	Watercare's Asset Management Plan 2021-2041
ASR	Activated Sludge Reactors
AUP	Auckland Unitary Plan Operative in part (Updated 16 February 2024)
BNR	Biological Nitrogen Removal
BOD	Carbonaceous Biochemical Oxygen Demand – 5 day test
BPO	Best Practicable Option
CMA	Coastal Management Area
DIN	Dissolved Inorganic Nitrogen (same as SIN)
DO	Dissolved Oxygen
DRP	Dissolved Reactive Phosphorus
E-Coli	*Escherichia coli*
EMP	Environmental Management Plan
EOC's	Emerging Organic Contaminants
EPT	Percentage of Sensitive Species
FC	Faecal Coliform
HGMPA	Hauraki Gulf Marine Park Act 2000
IBI	Fish Index of Biotic Integrity
I&I	Inflow and Infiltration
MBR	Membrane Bioreactors
MCI	Macroinvertebrate Community Index
MDRS	Medium Density Residential Standards
N	Nitrogen
NBL	National Bottom Line
NES-F	National Environmental Standard Freshwater 2020
NH4-N	Ammoniacal nitrogen
NOx-N	Nitrate plus nitrite nitrogen
NPS-FM	National Policy Statement for Freshwater Management 2020

Abbreviations	Full Name
NPS-IB	National Policy Statement on Indigenous Biodiversity
NTU	Turbidity
NZCPS	New Zealand Coastal Policy Statement 2010
PC78	Plan Change 78 to the AUP
PDP	Pattle Delamore Partners Ltd.
PE	Population Equivalent
pH	Measure of acid or base nature of liquid
PNEC	Predicted no effect concentrations
PPC88	Private Plan Change 88 Beachlands South
ppt	Parts per trillion
OFDOMP	Overland Flow Design and Operational Management Plan
O & M Manual	Operation and Maintenance Manual
QMRA	Quantitative Microbial Risk Assessment
RAS	Return Activated Sludge
RMA	Resource Management Act 1991
RPS	Regional Policy Statement
RQ	Risk Quotients
SEA	Significant Ecological Area
SIN	Soluble Inorganic Nitrogen (same as DIN)
SOI	Statement of Intent 2023 to 2026 Watercare Services
TKN	Total Kjeldhl Nitrogen
TN	Total Nitrogen
TP	Total Phosphorus
TSS	Total Suspended Solids
UF	Ultrafiltration
UV	Ultraviolet Light
WAS	Waste Activated Sludge
Watercare	Watercare Service Ltd
WWTP	Beachlands Wastewater Treatment Plant

1. Introduction

1.1 Watercare's Role in Relation to Auckland's Wastewater

Watercare is a lifeline utility responsible for the planning, maintenance, and operation of wastewater services to communities in Auckland. Watercare's activities and programmes are funded through user charges and borrowings. It is required by the Local Government (Auckland Council) Act 2009 to be a minimum-cost, cost-efficient service provider.

Watercare collects wastewater from 1.7 million people's homes including trade waste from industry, through approximately 8,700 Km of pipelines. Pumps through 534 pump stations, treats approximately 410 million litres of wastewater daily through 18 treatment plants and disposes in environmentally responsible ways to protect the public health, the local environment and coasts and harbours (refer to Figure 1-1).

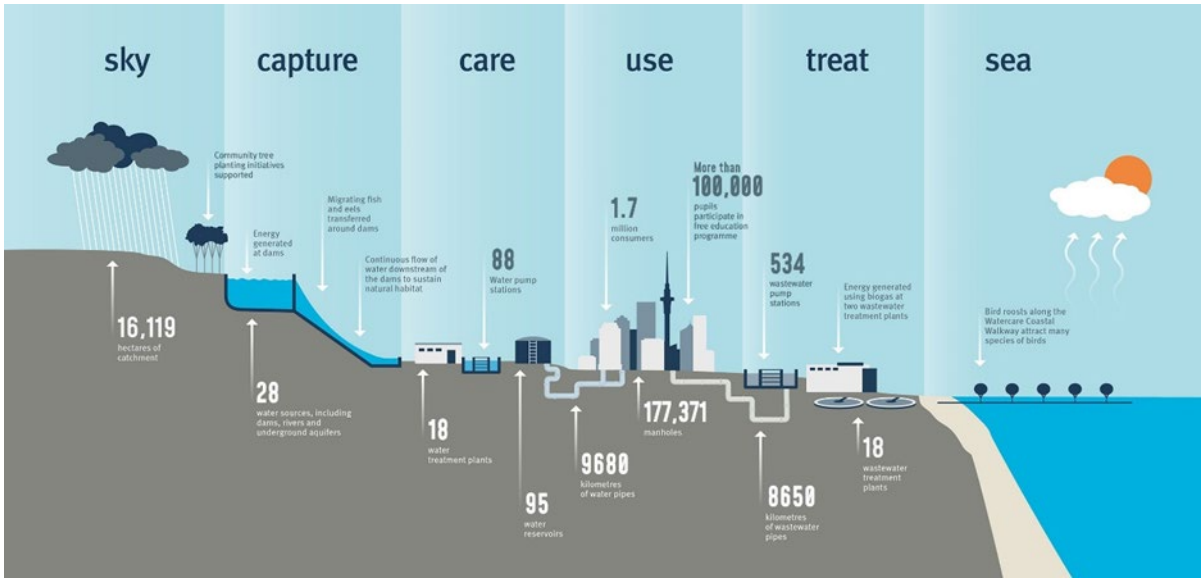


Figure 1-1: Overview of Watercare Assets and Operations

Watercare carries out significant work to upgrade and build infrastructure, to maintain levels of service and provide capacity for a fast-growing population. Watercare ensures Auckland and its people continue to enjoy dependable services by upgrading its assets, planning, building, and delivering new infrastructure in cost-efficient ways.

1.2 Background

The Beachlands and Maraetai communities are currently serviced by a wastewater network that connects to Watercare's Beachlands Wastewater Treatment Plant (**WWTP**). There are around 3,400 existing wastewater-only connections (there is no reticulated water supply) in Beachlands and Maraetai; around 2,500 connections are in Beachlands, with the remainder in Maraetai.

Wastewater from the Beachlands Maraetai community is treated at and discharged from the WWTP located at 100 Okaroro Drive, approximately 5 km south of the Beachlands urban area. The WWTP and discharge location is situated on Watercare land in a rural area (see Figure 1-2 and Figure 1-3).

Figure 1-2: WWTP Location

Figure 1-3: Beachlands and Maraetai Wastewater Scheme

(Source: Beachlands, Maraetai and Whitford Village Servicing Strategy)

The Beachlands and Maraetai communities were originally serviced by onsite septic tanks before the Beachlands WWTP was constructed in 1995 by the Manukau City Council. The original treatment process was an aerated lagoon followed by a series of partially mixed aerated lagoons and wetlands, with the treated wastewater discharged into a tributary of the Te Puru Stream via an overland flow system. The WWTP was upgraded in 2009 to convert the aerated lagoon into an activated sludge biological nitrogen removal (**BNR**) process incorporating chemical phosphorus removal, tertiary filtration and UV disinfection.

The current resource consent that applies to the discharge of treated wastewater from the WWTP is for the 'discharge of treated domestic wastewater to the Te Puru Stream via ground soakage' (Consent Number 26875). The consent was initially granted by Auckland Regional Council in November 2004 with a consent order issued by the Environment Court in August 2005. The current consent has a maximum daily discharge volume limit of 2,800 m³/day and expires on 31 December 2025.

Like much of Auckland, the service area of the WWTP is subject to significant growth (see Section 2 for details), which is placing pressure on the treatment and flow capacity of the current WWTP. In addition, the existing WWTP is coming to the end of its design life and several components need to be upgraded or replaced.

For these reasons, Watercare is seeking to replace the existing resource consent with an approach which provides for phased increases in the discharge volumes and a corresponding staged upgrade of the WWTP.

1.3 Overview of the Current Wastewater Scheme

Wastewater from the Beachlands Maraetai community is pumped to the WWTP from the Te Puru pump station in Beachlands via a 5 km rising main. The current WWTP comprises a step screen and vortex grit removal chamber which removes gross solids and particles, a bioreactor which removes organic pollutants, nitrogen and phosphorus, a clarifier which separates the fine solids from the wastewater, a disc filter which further removes residual suspended solids and Ultraviolet Light (**UV**) disinfection which further treats the microorganisms in the wastewater.

Following the UV disinfection, the treated wastewater is discharged to land via an overland flow system. The treated wastewater from this system then enters groundwater and a pond (known as the farm pond), located on a tributary of the Te Puru Stream. The existing WWTP is described in detail in Section 2.4.

The WWTP site is owned by Watercare and comprises an area of approximately159 ha as shown on Figure 1-4 below. The land on which the WWTP and overland flow system is located is designated 'Wastewater purposes – wastewater treatment plant' (Designation 9537) under the Auckland Unitary Plan Operative in part (Updated 16 February 2024) (AUP) (refer to Figure 1-4). The designation does not contain any conditions. The underlying zoning of the designated land is Mixed Rural Zone. The balance of the site is zoned a combination of Rural Coastal Zone and Mixed Rural Zone.

The site includes two Significant Ecological Areas Terrestrial (SEA_T) which are shown on Figure 1-4 below. SEA_T428 applies to the farm pond, tributaries of the Te Puru Stream and associated riparian areas. SEA_T_5259 applies to an area on the southern portion of the WWTP site which will is current occupied by pine forest. The Watercare owned land is shown within the yellow outline, and the SEAs as green x shading. The designation is shown as a brown outline and the Watercare property boundary with the yellow line.

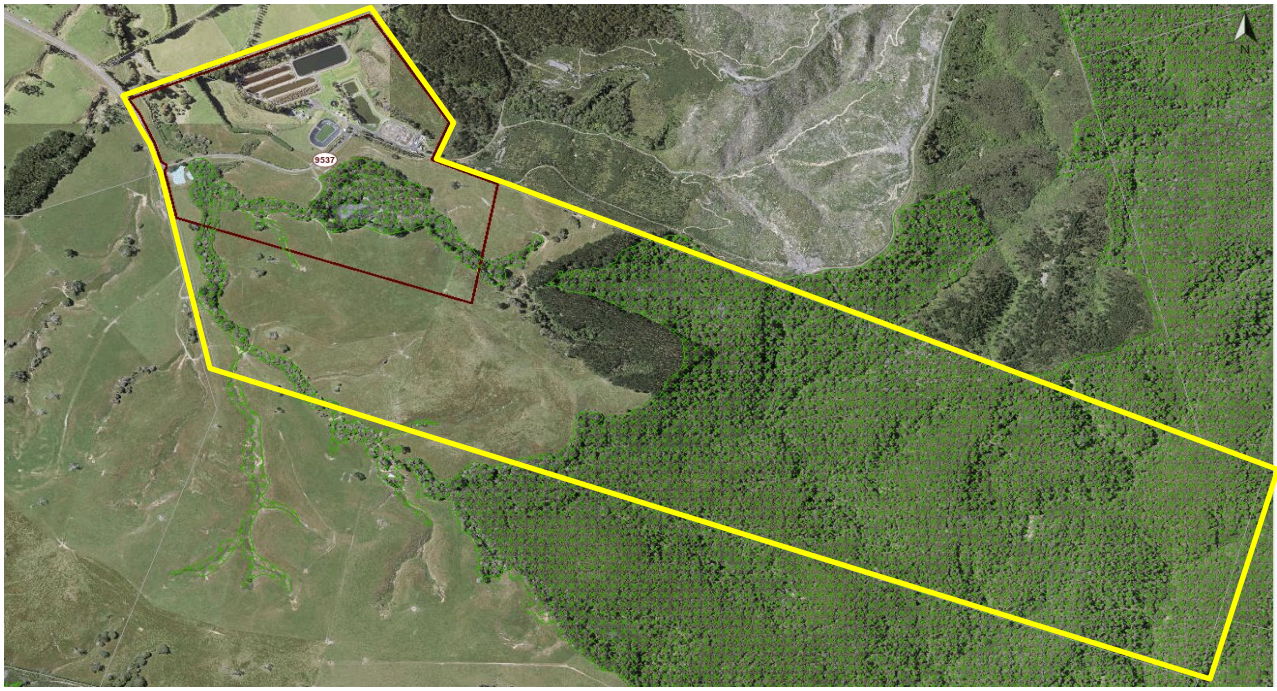


Figure 1-4: WWTP Site, Designation and SEA Overlays

1.4 Overview of the Proposal

The proposal is to discharge treated wastewater from the WWTP, via an overland flow system, to a tributary of the Te Puru Stream and to groundwater for a term of 35 years. This involves the short-term continuation of the discharge from the current WWTP; discharge following a Short-term upgrade to the WWTP; and discharge following the replacement of the WWTP with a new MBR WWTP (Long-term Stages 1 and 2). The timing of the replacement of the WWTP will be triggered by discharge flow rate, based on a population equivalent (PE).

Throughout the consent term the treated wastewater will be discharged via an overland flow system to groundwater and the farm pond located on a tributary of the Te Puru Stream. The expansion of the overland flow system to accommodate increases in treated wastewater flows will be undertaken when the Short-term upgrade to the existing WWTP is undertaken. The upgrade stages are described in detail in Section 2.7.

The proposal will enable the servicing of future growth in the Beachlands Maraetai area and in particular the Beachlands South area which is subject to a recently allowed plan change and a proposed business park which is subject to a fast-track consenting process. Both these proposed developments originally included individual wastewater treatment and discharge solutions. The proposed upgrades and new MBR WWTP will enable the reticulation of the wastewater from these new developments to the WWTP for treatment and discharge. This is a positive outcome as the centralisation of the area's wastewater treatment and discharge at the WWTP will result in only one discharge to the environment rather than three separate discharges. It will also ensure the consistent and effective management of the community's wastewater by a highly competent and experienced operator.

1.5 Summary of Consent Sought

This application only seeks consent for the discharge of treated wastewater from the WWTP, via an overland flow system, to a tributary of the Te Puru Stream, and to groundwater. A more detailed description of the consent sought is contained in Section 4.

No other consents (e.g. replacement of the existing air discharge permit or consents under national environmental standards) or other approvals (e.g. alteration to the Beachlands WWTP designation under s181 of the Resource Management Act (RMA)) are being sought as part of this application.

It is noted that the existing air discharge consent (permit # 26876) has a later expiry date than the wastewater discharge consent. Watercare intends to lodge the air discharge consent application in accordance with the timeframes set under s124 of the RMA.

In the event they are required, Watercare would apply for any additional consents once detailed design phase of the project has been completed.

1.6 Project Objectives

Project Objectives have been developed for this Project and are as follows:

Work in partnership with the Mana Whenua and engage with the community to identify the best practicable option (BPO) to provide wastewater services for the Beachlands and Maraetai community. The BPO must:

- *Recognise the significance of the Hauraki Gulf and the historic, traditional, cultural, and spiritual relationship of the tangata whenua with the Hauraki Gulf and its islands.*
- *Give effect to Te Mana o te Wai.*
- *Keep our communities healthy.*
- *Protect the health of our environment, particularly the life supporting capacity of land, air, and water.*
- *Provide a solution that caters for planned growth that keeps the overall costs of service to customers (collectively) at sustainable levels.*
- *Be sustainable and resilient and minimise whole-of-life carbon emissions and optimise resource recovery.*

The Project Objectives have been used to inform the Best Practicable Option assessment of alternatives for the WWTP and discharge.

1.7 Structure of Application Documentation

The resource consent application comprises the following documents:

- Application and Assessment of Environmental Effects (this document).
- Stantec - Beachlands Wastewater Scheme Resource Consent Project - Alternatives Assessment Report, April 2024;
- Streamlined Environmental - Beachlands Wastewater Treatment Plant – water quality, ecological and human health effects assessment;
- Pattle Delamore Partners (PDP) – Beachlands WWTP: Preliminary assessment of land area requirements for overland flow system explanation – Memorandum 1;
- PDP – Beachlands WWTP: Assessment of Overland Flow System Treatment Performance – Memorandum 2;
- PDP – Beachlands WWTP: Assessment of Overland Flow System Treatment Performance – Memorandum 3 (interim);
- PDP – Assessment of Potential Effects on Soils and Ecology from Beachlands WWTP Overland Flow System (Memorandum 4);
- PDP – Beachlands Maraetai WWTP Resource Consent Renewal: Stream Hydraulic Assessment;
- NIWA – Beachlands WWTP Discharge: Assessment of microbiological effects and health risk;
- DHI Water & Environment Ltd (DHI) – Assessment of Proposed Te Puru Stream Discharge;
- Bioresearches – Water Quality and Biological Assessment, Te Puru Stream Tributary, Beachlands;
- Bioresearches – Te Puru Stream WWTP Discharge Assessment of Effects on Stream Habitat; and
- Beachlands WWTP – Wastewater Discharge Consent Project – Stakeholder Engagement Report, May 2024.

1.7.1 RMA Schedule 4 Requirements

The table below sets out the RMA Schedule 4 requirements for resource consents and which section of this document addresses each of the requirements.

Table 1-1: RMA Schedule 4 Requirements

Schedule 4 Information	Relevant Section
Description of the activity	Section 2
Description of the site at which the activity is to occur	Section 3
Full name and address of each owner or occupier of the site	Application forms
Description of any other activities that are part of the proposal to which the application relates	Section 4
Description of any other resource consents required for the proposal to which the application relates	Section 4
An assessment of the activity against the matters set out in Part 2	Section 12
An assessment of the activity against any relevant provisions of the relevant national environmental standards, other regulations, policy and planning documents referred to in section 104(1)(b) including: (a) any relevant objectives, policies, or rules in a document; and (b) any relevant requirements, conditions, or permissions in any rules in a document; and (c) any other relevant requirements in a document (for example, in a national environmental standard or other regulations).	Section 12
If it is likely that the activity will result in any significant adverse effect on the environment, a description of any possible alternative locations or methods for undertaking the activity	Section 2
An assessment of the actual or potential effect on the environment of the activity	Sections 5 - 9
If the activity includes the use of hazardous installations, an assessment of any risks to the environment that are likely to arise from such use	N/A
If the activity involves the discharge of any contaminant, a description of: (i) the nature of the discharge and the sensitivity of the receiving environment to adverse effects; and (ii) any possible alternative methods of discharge, including discharge into any other receiving environment	Sections 2 and 3
A description of the mitigation measures (including safeguards and contingency plans where relevant) to be undertaken to help prevent or reduce the actual or potential effect	Section 10
Identification of the persons affected by the activity, any consultation undertaken, and any response to the views of any person consulted	Section 13

Schedule 4 Information	Relevant Section
If the scale and significance of the activity's effects are such that monitoring is required, a description of how and by whom the effects will be monitored if the activity is approved	Section 11
If the activity will, or is likely to, have adverse effects that are more than minor on the exercise of a protected customary right, a description of possible alternative locations or methods for the exercise of the activity (unless written approval for the activity is given by the protected customary rights group)	NA
An assessment of the activity's actual or potential effects on the environment that addresses: (a) any effect on those in the neighbourhood and, where relevant, the wider community, including any social, economic, or cultural effects: (b) any physical effect on the locality, including any landscape and visual effects: (c) any effect on ecosystems, including effects on plants or animals and any physical disturbance of habitats in the vicinity: (d) any effect on natural and physical resources having aesthetic, recreational, scientific, historical, spiritual, or cultural value, or other special value, for present or future generations: (e) any discharge of contaminants into the environment, including any unreasonable emission of noise, and options for the treatment and disposal of contaminants: (f) any risk to the neighbourhood, the wider community, or the environment through natural hazards or hazardous installations.	Sections 5 - 9

2. Description of the Activity

2.1 Current Serviced Area

The area serviced by the Beachlands WWTP includes the communities of Beachlands and Maraetai. There are around 3,400 existing wastewater-only connections (there is no reticulated water supply) in Beachlands and Maraetai; around 2,500 connections are in Beachlands, with the remainder in Maraetai.

The red lines show the current extent of the area serviced by the WWTP as shown in Figure 2-1.

Figure 2-1: Beachlands-Maraetai WWTP Serviced Area (Auckland Council GIS Map Viewer)

2.2 Future Serviced Areas

The catchment population for the Beachlands WWTP is expected grow substantially over the life of the consent sought in this application. Growth is expected to occur as result of both infill and greenfield development.

Initial growth will be generated by a significant private plan change (Private Plan Change 88 – Beachlands South (**PPC88**)) and a resource consent application for a business park provided these applications are approved.

PPC88 was publicly notified on 26 January 2023. PPC88 seeks to rezone 307 hectares of land south of the Beachlands township from Rural – Countryside Living to a combination of live residential, business, and open space zones, with a new precinct and Future Urban Zone (southern portion of land, 147.58 hectares). (see Figure 2-2 below). The developer anticipates building approximately 3,000 new homes of varying typologies in the Beachlands area in stages until 2038, with a further 1,500 at a later date through a Future Urban Zone. Implementation of the Future Urban Zone will require additional plan changes in the future.

The development is also expected to include a Village Centre, Community and Employment sub-precincts, primary and secondary schools, visitor accommodation, and a golf course.

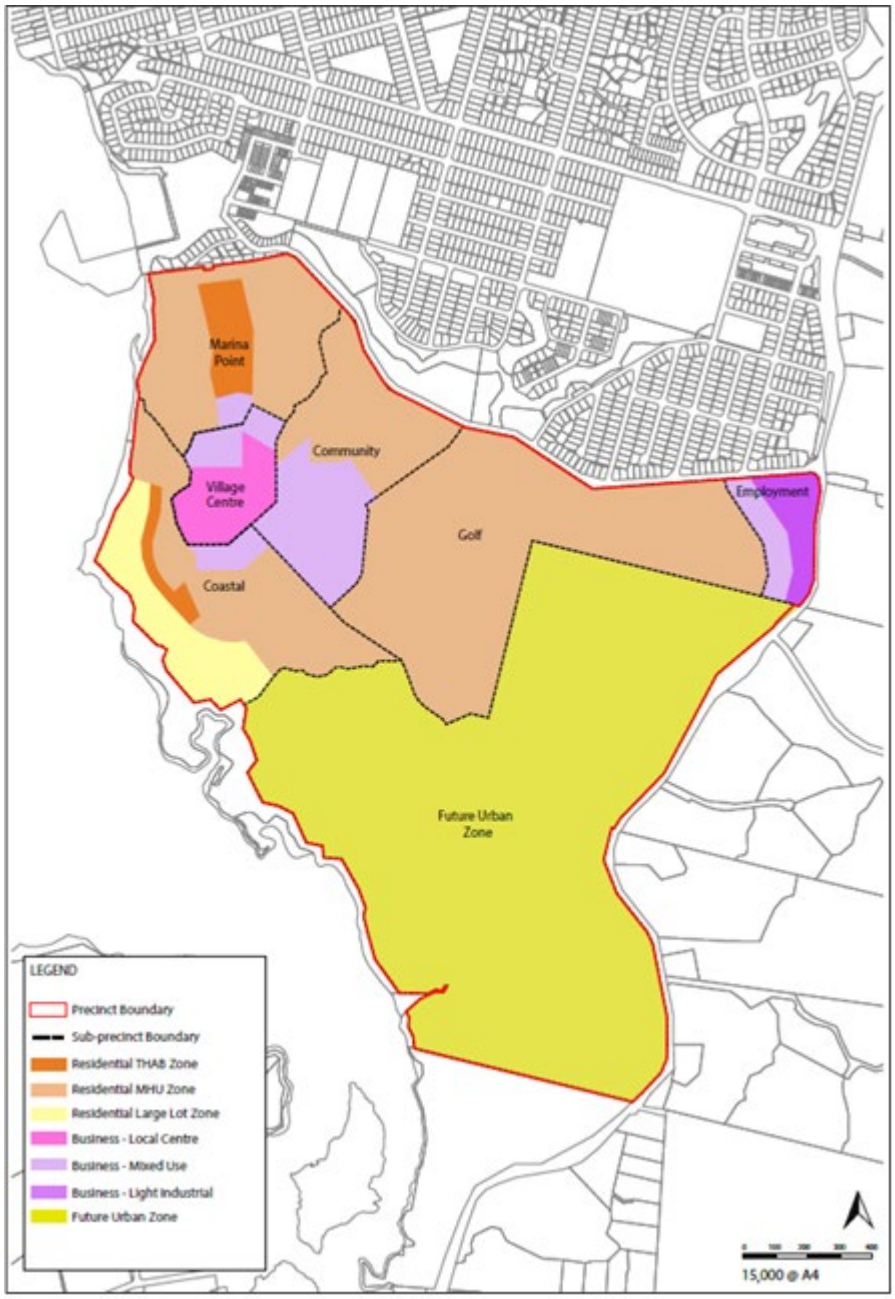


Figure 2-2: PPC88 Proposed Beachlands South Zoning and Sub-precincts Plan

(Source: Reply Legal Submissions on behalf of Beachlands South Partnership)

While PPC88 proposes a private pressure sewer system with a separate wastewater treatment facility, Watercare's preference is that if the development proceeds it should connect to the existing Beachlands WWTP.

On 2 April 2024 Independent Commissioners of behalf of Auckland Council approved PPC88. The reasons for the decision are that PPC88:

a. is supported by necessary evaluation in accordance with s 32 and s 32AA of the RMA;

b. will give effect to the National Policy Statement Urban Development and the Regional Policy Statement;

c. satisfies the provisions of Part 2 of the RMA; and

d. will assist the Council in achieving the purpose of the RMA.

The decision is the subject of appeals to the Environment Court, which had not been resolved as at the date this AEE was finalised.

Resource consent has been applied for under the COVID 19 Fast Track process to subdivide approximately 12 hectares of land for a business park for light industrial and business uses adjacent to a former quarry site on the Whitford Maraetai Road at Beachlands. Land use consent has also been sought to construct 5,200m^2 of industrial warehousing with associated hard stand and parking areas and 17,000m^2 of yard-based light industrial activities. An on-site wastewater treatment facility with a discharge to the Ruangaiagai Stream (which is a tributary of the Te Puru stream) is proposed. However, Watercare has been working with the developer to enable the wastewater generated by the proposal to be conveyed to the Beachlands WWTP for treatment.

Future wastewater servicing for the PPC88 proposal and the proposed Business Park have been taken into account in the development of this application.

Plan Change 78 to the AUP (**PC78**) responds to the previous government's National Policy Statement on Urban Development 2020 (amended in 2022) and Medium Density Residential Standards (**MDRS**) of the RMA. Through the use of MDRS the government requires the Council to enable medium-density housing across most of Auckland's residential suburbs. Three dwellings of up to three storeys, including terrace housing and low-rise apartments, are to be permitted on most residential properties unless a 'qualifying matter' applies. Qualifying matters are characteristics about some properties or within some areas that may allow the council to modify, or reduce, required building heights or density.

The Beachlands Maraetai urban area is subject to two qualifying matters: the water and wastewater for residential sites with existing significant capacity constraints, and transport constraints. The water and wastewater constraint requires that a restricted discretionary activity resource consent application has to be made for more than one dwelling per site and for subdivision. The granting of this application and the commissioning of the proposed upgrades / new WWTP would remove the need for wastewater constraint qualifying matter introduced by PC78.

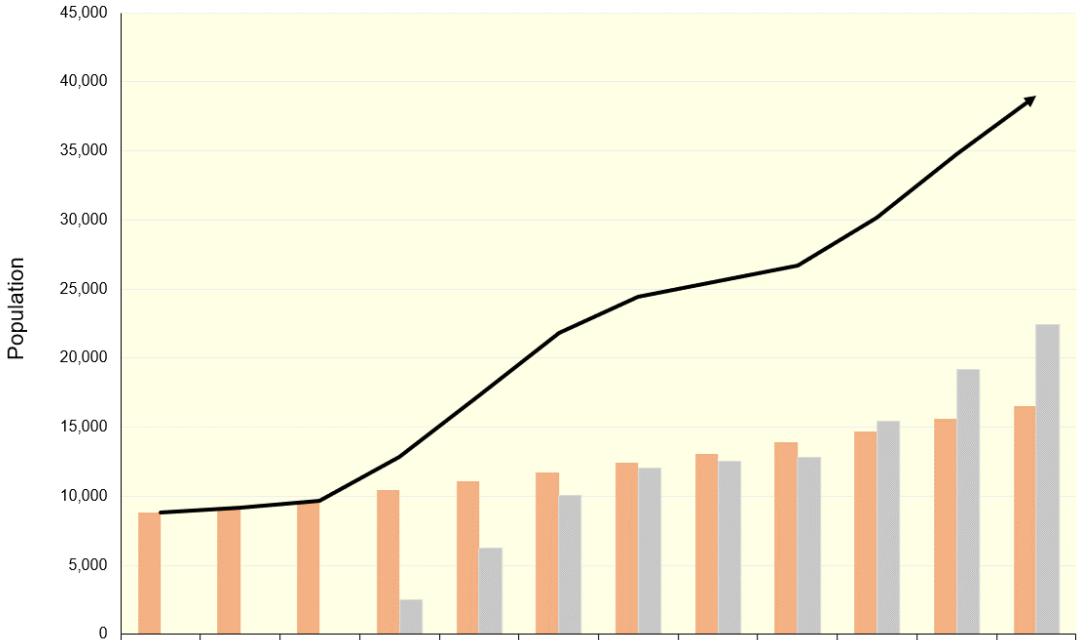
There is some uncertainty over the future of PC78 given that the coalition government has signalled its intention to amend the RMA to make the MDRS optional for councils. The government has also granted the Council a further one-year extension of time to notify its decisions on PC78 from 31 March 2025 to 31 March 2026.

2.3 Projected Future Connected Population

Factors influencing future population growth and resulting population forecasts for the WWTP are discussed and presented in Watercare's Servicing Strategy for Beachlands, Maraetai and Whitford (Watercare, May 2023).

Infill and greenfield development are expected to result in substantial population growth in the catchment for the WWTP. Figure 2-3 illustrates the projected population growth for the catchment. By the end of the 35-year consent duration sought in this application (approximately 2059-60) the projections estimate that the population serviced by the WWTP will be 30,000 PE1. This population estimate has been used as the design basis for the New WWTP (MBR) Stages 1 and 2 proposed in this application.

[1] PE is the population equivalent in units of domestic residents using standard per capita flow and loads. This approach allows for commercial and industrial wastewater (trade waste).



	2018	2020	2023	2028	2033	2038	2043	2048	2053	2058	2063	2068
Average Beachlands Population Growth	8835	9181	9704	10412	11086	11727	12399	13061	13892	14720	15602	16543
Total Population from Proposed Developments	0	0	0	2470	6240	10067	12017	12537	12810	15410	19180	22430
Average Growth, plus proposed Development	8835	9181	9704	12882	17326	21794	24417	25599	26702	30130	34782	38974

Figure 2-3: Population projections for the Beachlands WWTP catchment (Watercare, May 2023)

2.4 Current Wastewater Treatment Plant

Wastewater from Beachlands and Maraetai is pumped to the WWTP from the Te Puru pump station in Beachlands via a 5 km rising main. At the WWTP, the wastewater initially passes through a step screen which removes gross solids and particles greater than 3mm followed by a vortex grit removal chamber. The wastewater then enters the bioreactor lagoon. The bioreactor lagoon is divided into zones known as a 4-stage Bardenpho process. The core function of the bioreactor is to remove organic pollutants, nitrogen and phosphorus. At separate locations within the bioreactor, acetic acid and aluminium sulphate (alum) are dosed into the wastewater to assist in the removal of nitrogen and phosphorus respectively.

Following the bioreactor lagoon, mixed liquor (treated wastewater and biological solids) passes through a clarifier which separates the suspended solids from the wastewater. The suspended solids are returned to the bioreactor lagoon as return activated sludge (**RAS**), to trap the solids within the process and maintain the required concentration of microorganisms to consume the incoming wastewater as “food”. Excess solids, or waste activated sludge (**WAS**) is wasted to two sludge lagoons where the solids digest before transfer to sand drying beds and then disposal to Hampton Downs landfill. The disposal of the dried sludge is not subject of this resource consent application as it is managed via landfill disposal at a consented landfill.

Treated wastewater then passes through a disc filter which further removes residual suspended solids which are carried over the clarifier weir. The remaining filtered wastewater then enters the UV disinfection facility which further treats the microorganisms in the wastewater.

From the UV facility, the treated wastewater is discharged to land via the overland flow system consisting of an approximately 1.5 ha vegetated discharge field and riparian plantings as shown in Figure 2-6. Following dispersal through the overland flow system, the discharge enters a tributary to the Te Puru Stream which has been dammed to form a pond (known as the farm pond).

The WWTP contains a 6,000 m^3 storm buffer pond and a 9,700 m^3 post treatment buffer pond to manage high flow storm events. A process flow diagram and aerial photograph of the current treatment plant is presented in Figure 2-4 and Figure 2-5.

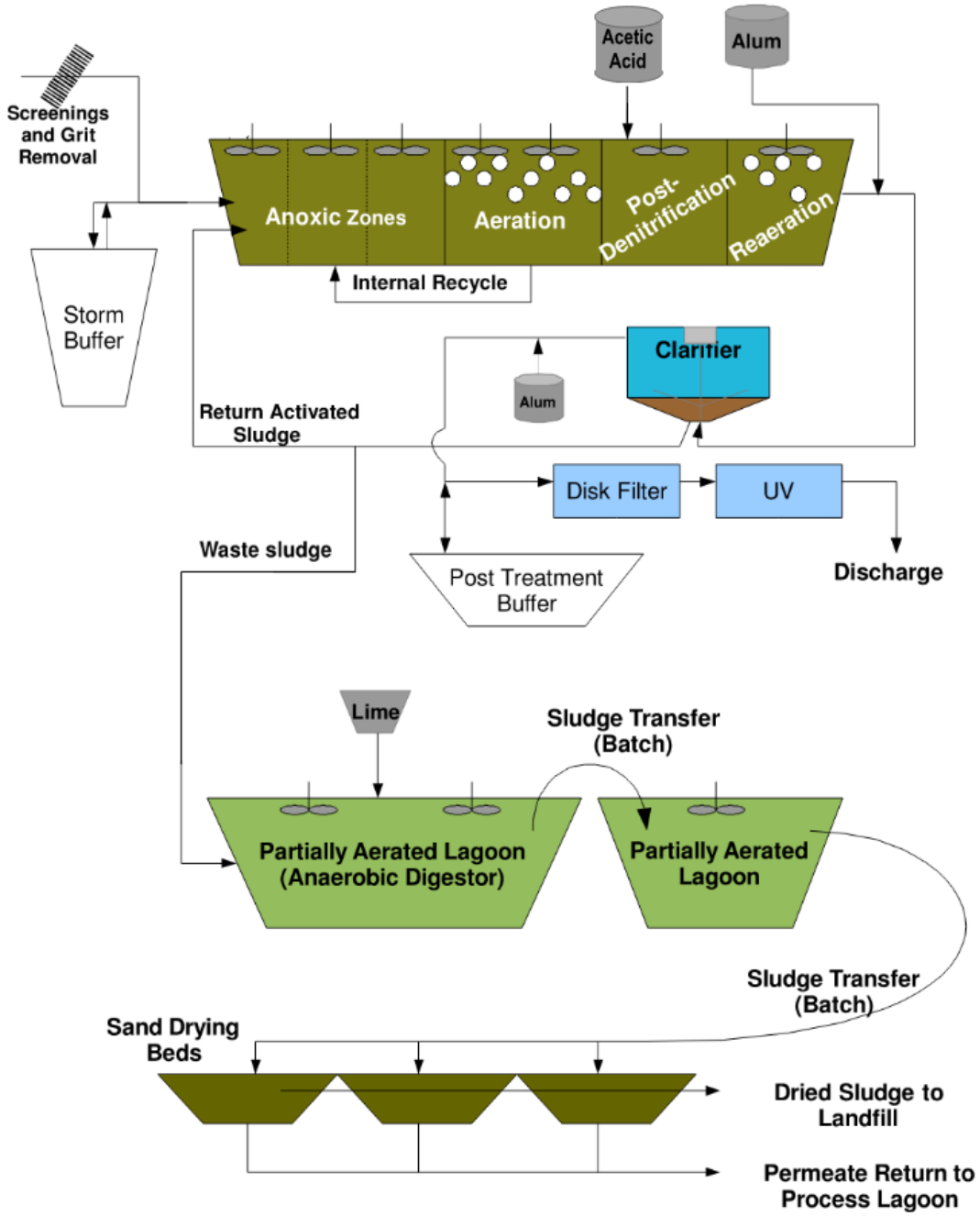


Figure 2-4: Beachlands Current WWTP Process Flow Diagram

Figure 2-5: Beachlands WWTP Aerial Photograph – Current Layout

Figure 2-6: Beachlands WWTP Overland Flow Area Aerial Photograph

2.4.1 Wastewater Flows

Influent (untreated wastewater entering the WWTP) and treated wastewater flow data from the past five years is presented in Figure 2-7 and Figure 2-8.

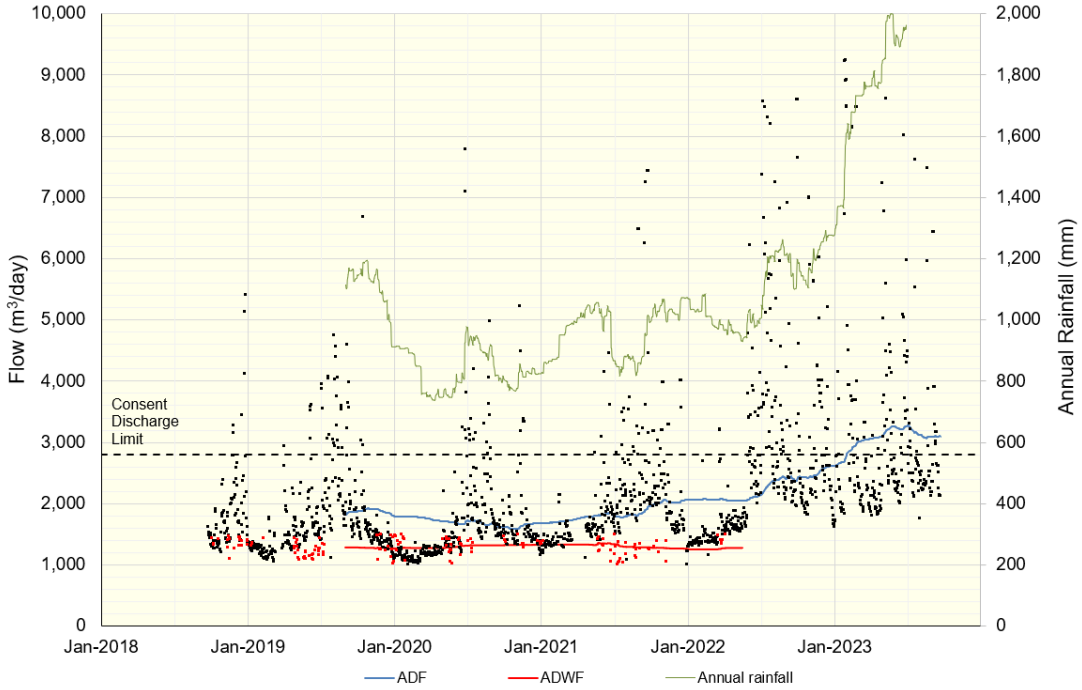


Figure 2-7: Beachlands WWTP Influent Flow and Rainfall Data 2018-2023

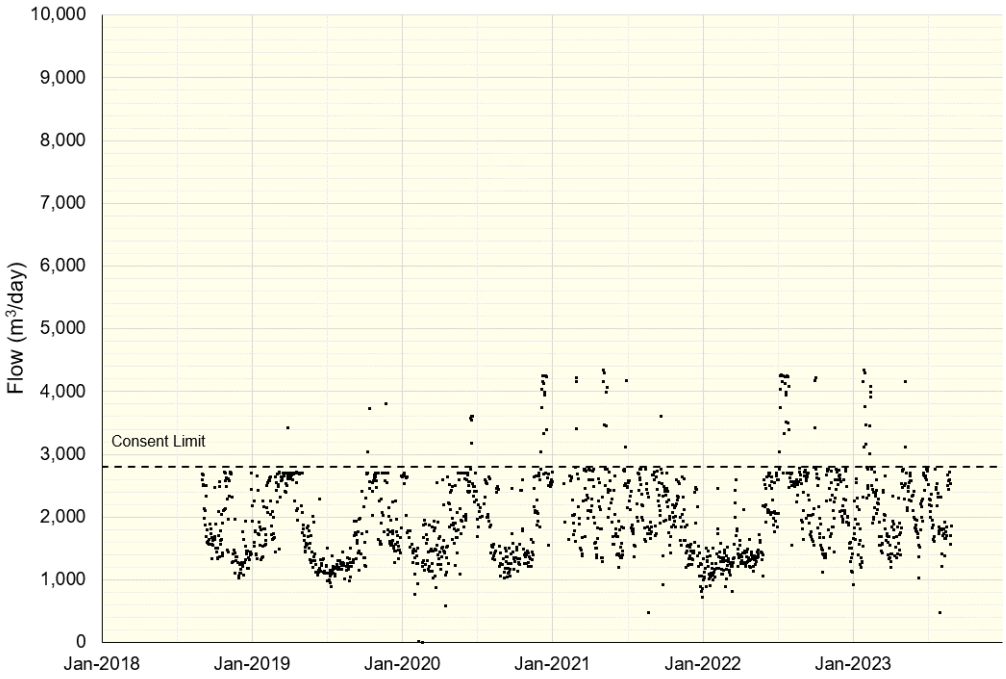


Figure 2-8: Beachlands WWTP Treated Wastewater Flow Data 2018-2023

Figure 2-7 illustrates the effect of rainfall on inflows to the WWTP. In late 2022 and early 2023, inflow to the WWTP increased markedly which, as illustrated in Figure 2-7, reflects the unusually high rainfall over this period. Prior to 2021 there was an issue with seawater ingress into the system, however the main source of the ingress was identified and

rectified in 2021. Any remaining salinity in the influent from seawater ingress is expected to be diluted over time with population growth as new pipes are unlikely to have this issue.

High inflows are largely offset by storage within the WWTP site (i.e. the storm buffer pond and post treatment buffer pond), as shown in Figure 2-8. The storage system has performed well in limiting the daily discharge volume to within the current consent limit of 2,800m^3 on most occasions. However, the system is vulnerable to prolonged rainfall and resulting high inflows which exceed the storage system. To address the non-compliances it is proposed to raise the maximum daily discharge limit from 2,800m^3 to 4,500 m^3 immediately (ie. as soon as the new consent commences)).

2.4.2 Compliance with current consents

The Beachlands WWTP has largely been compliant with the conditions of its existing resource consents. The 2022-2023 Annual report[2] for the WWTP states that:

> *In 2022, daily discharges from the Beachlands WWTP were above the consented maximum volume limit on 20 days in July and 3 days in October 2022. High rainfall increased the inflow and infiltration in the wastewater network significantly and subsequently the flow into the plant. It was not possible to store all the incoming flows in the storm buffer and post-treatment ponds, the discharge was increased to treat as much of the raw wastewater as the process allowed. The discharge volume limits were breached again for 13 days across January and February 2023 due to the Auckland Anniversary storm event and Cyclone Gabrielle. Another extreme rainfall event in May 2023 resulted in three days where the plant exceeded the discharge limits. The alternative to breaching the discharge consent limit would be to force overflows in the wastewater network, particularly at pump stations.*

During the above-mentioned period, the highest flows were recorded at 4,331 m^3 per day. While flows were above the consented limit, the treated wastewater quality was compliant with the discharge limits.

In the 2019/20 and 2020/21 consent years, the WWTP was fully compliant with all treated wastewater quality conditions of its existing consent.

As already noted, on occasions the WWTP operations are non-compliant with the maximum daily discharge volume. These non-compliances arose during extreme and prolonged wet weather events which resulted in significantly high inflow and infiltration into the wastewater network connected to the WWTP. However, as discussed below, the treated wastewater quality was nearly always compliant with the consent standards.

2.4.3 Current Treated Wastewater Quality

Treated wastewater quality over the past five years has been excellent and is summarised in Table 2-1 and in Figures 2-8 to 2-13. These are the parameters included in the current consent that apply at the point of discharge from the UV system of the WWTP.

Table 2-1: Beachlands WWTP Treated Wastewater Quality 2018 – 2023

Parameter	Units	Median		90th percentile		95th percentile	
		Plant Results	Consent Limit	Plant Results	Consent Limit	Plant Results	Consent Limit
BOD	mg/L	1.2	-	4.0	**15**	-	-
TSS	mg/L	7.0	-	12	**15**	-	-
NO_3-N[3]	mg/L	0.8	-	5.3	**15**	-	-
NH_4-N (Nov– Apr)	mg/L	0.4	-	-	-	1.7	**4.0**

[2] Beachlands Wastewater Treatment Plant 2022- 2023 Annual Report, Final September 2023
[3] NO_3-N data excludes 2022-2023 data due to steady increase in concentrations compared to previous 4 years (see Figure 2-11).

Parameter	Units	Median		90th percentile		95th percentile	
		Plant Results	Consent Limit	Plant Results	Consent Limit	Plant Results	Consent Limit
NH_4-N (May–Oct)	mg/L	0.4	-	-	-	1.9	**5.0**
DRP	mg/L	0.3	-	0.7	**5**	-	-
Faecal coliforms	cfu/100mL	1.6	**14**	-	-	-	-

As shown in Table 2-3 and the figures below, treated wastewater quality is generally well below consent limits. The increases in NO_3-N and DRP observed over the last two to three years are the result of Watercare optimising their chemical dosing strategies. As shown, the WWTP was performing well below consented limits so there was scope to adjust chemical dosing rates and reduce operating costs.

There were two instances where the rolling 95th percentile ammoniacal nitrogen concentration exceeded the summer consent limit; in October 2018 – February 2019 and September 2019 to January 2020 (see Figure 2-12). In both instances these exceedances were due to a single high result (the rolling consent standard of using the previous 10 consecutive samples means a single high result takes several months to drop out of the compliance sample set). The reasons for the two high ammoniacal nitrogen results is not clear but could be due to mechanical issues with the aerator in the final aerobic zone of the bioreactor lagoon.

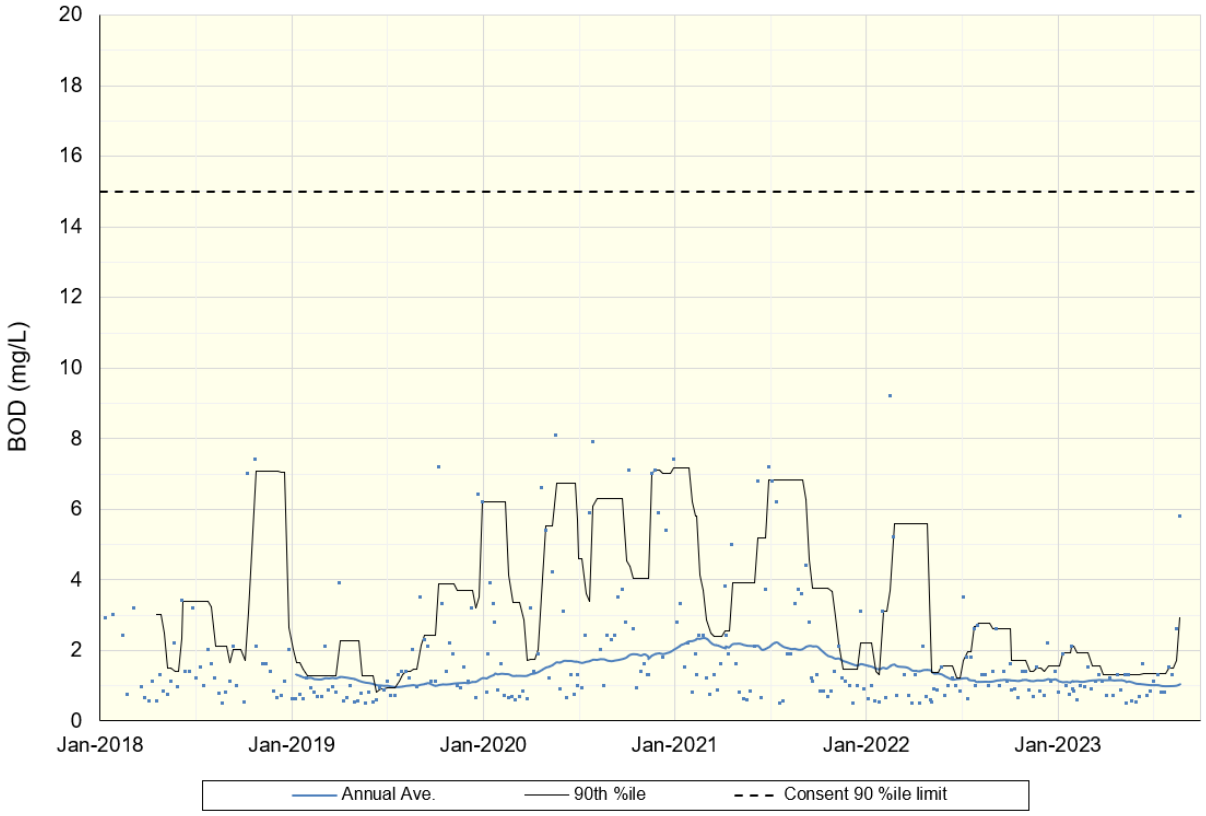


Figure 2-9: Beachlands WWTP Treated Wastewater BOD Concentrations 2018 – 2023

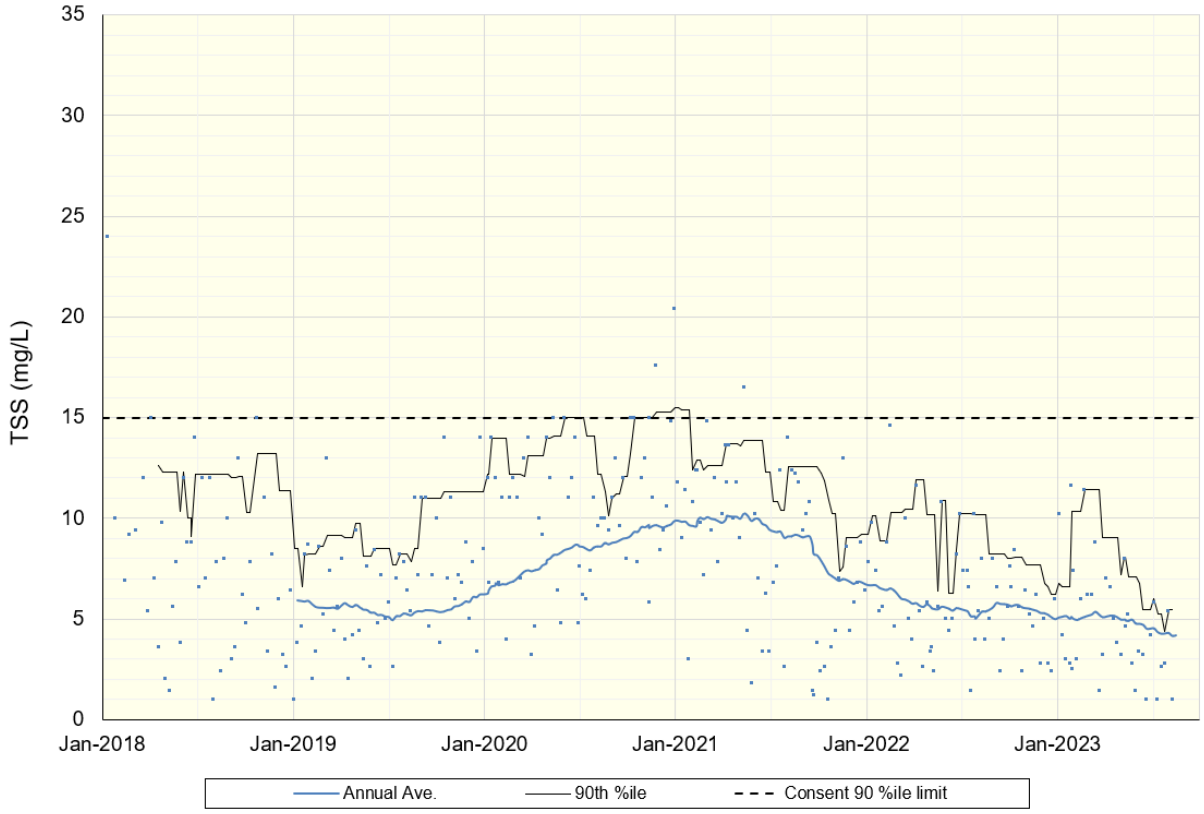


Figure 2-10: Beachlands WWTP Treated Wastewater TSS Concentrations 2018 – 2023

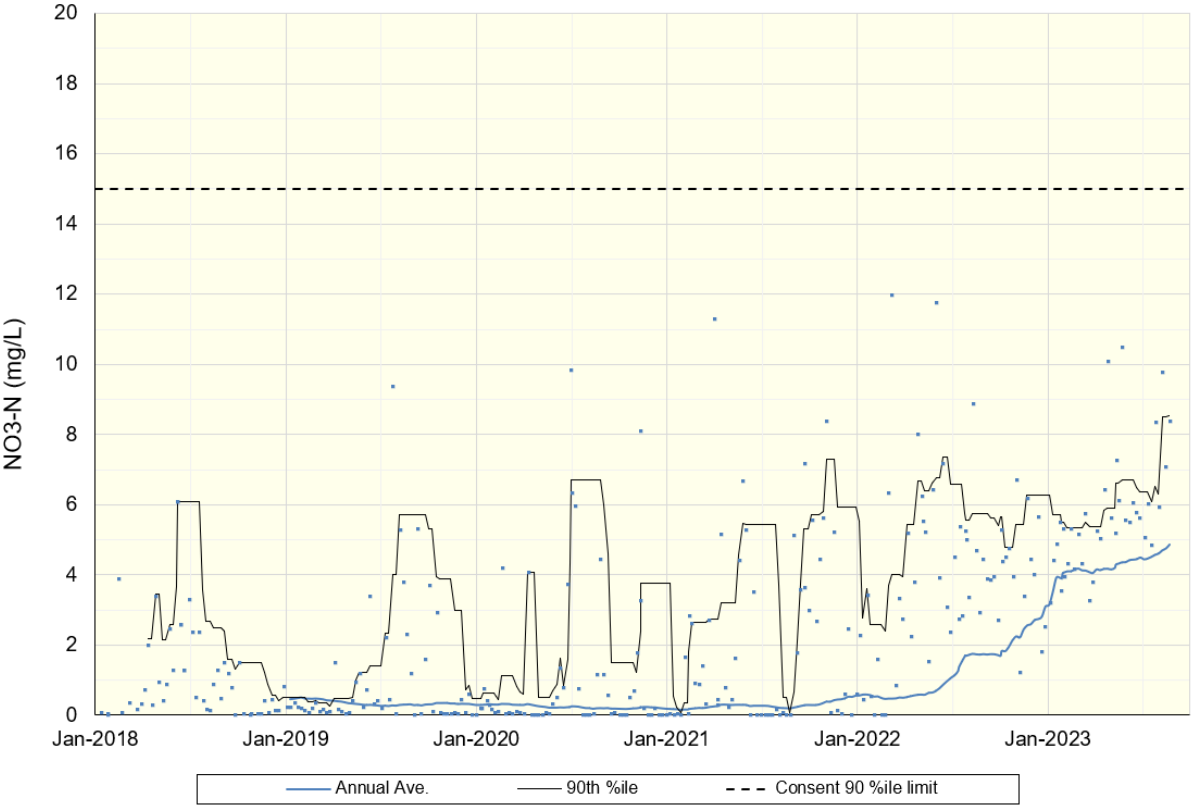


Figure 2-11: Beachlands WWTP Treated Wastewater NO_3-N Concentrations 2018 – 2023

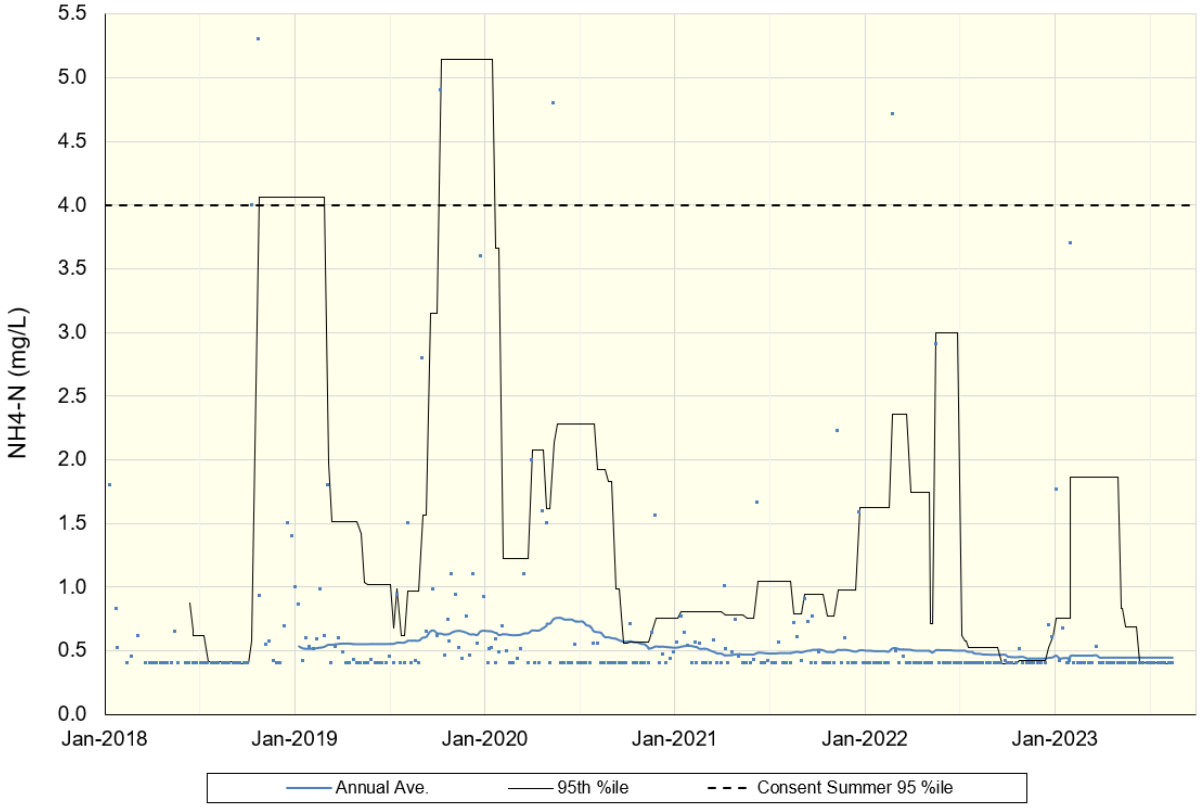


Figure 2-12: Beachlands WWTP Treated Wastewater NH_4-N Concentrations 2018 – 2023

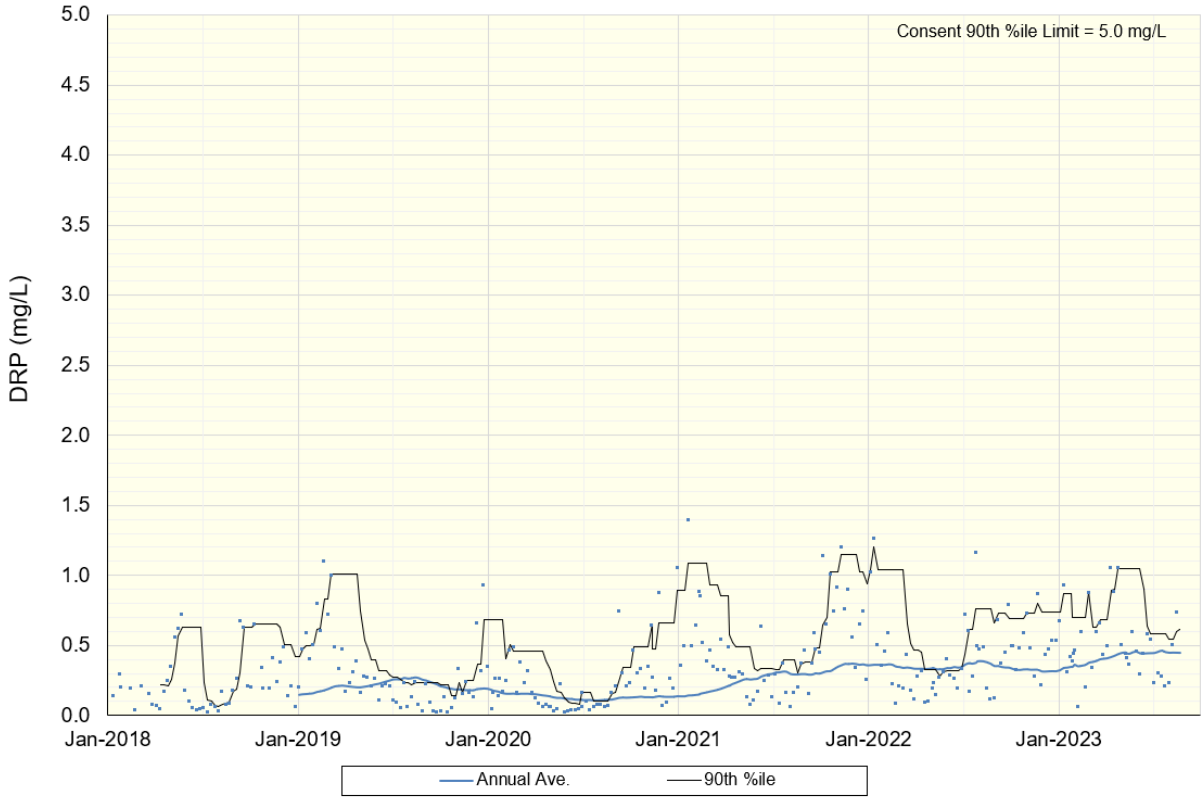


Figure 2-13: Beachlands WWTP Treated Wastewater DRP Concentrations 2018 – 2023

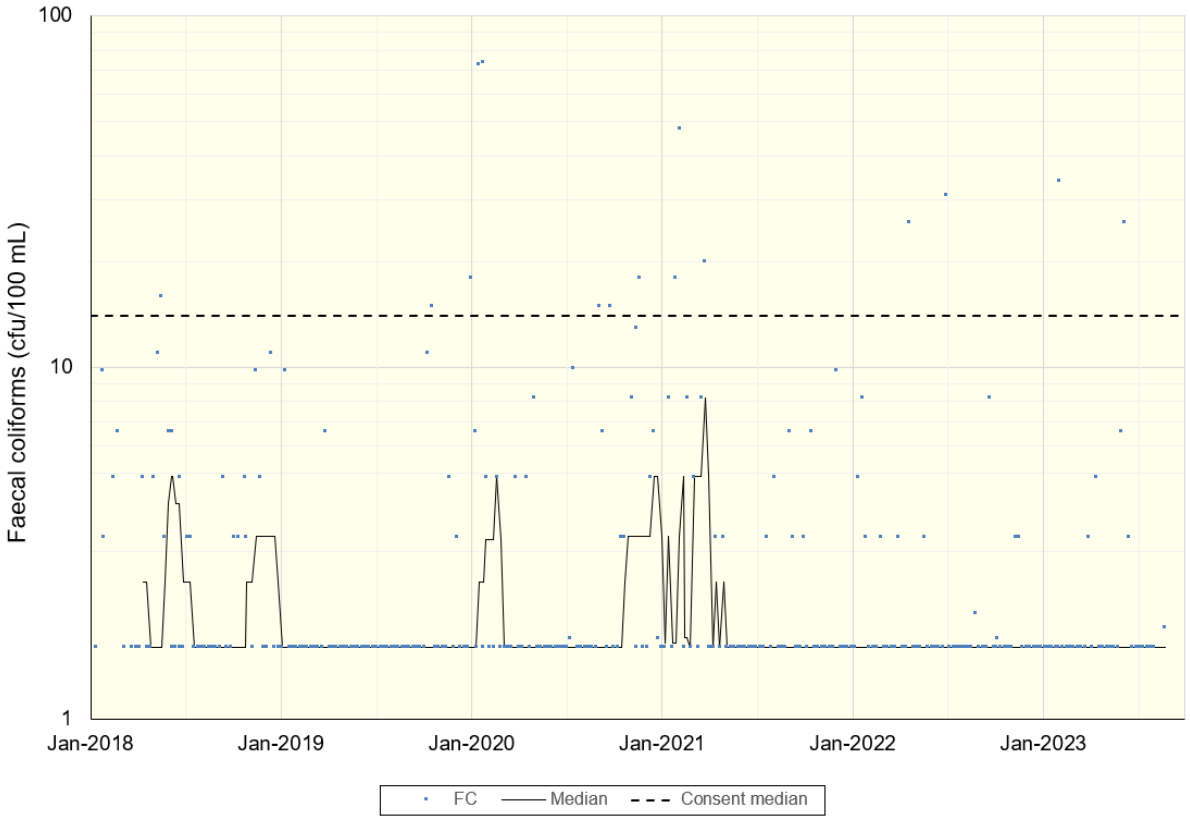


Figure 2-14 Beachlands WWTP Treated Wastewater Faecal Coliforms Concentrations 2018 – 2023

2.5 Existing Overland Flow System

The existing overland flow system consists of four dispersion zones each with three parallel series of PVC pipes elevated above the ground in the upslope section of the overland flow area covering an area of approximately 1.5 hectares. Treated wastewater from the UV disinfection system flows through the pipes via gravity and is dispersed through holes drilled in the pipes.

The length of overland flow slope between the distribution pipes and the farm pond edge ranges from approximately 50 – 100m dependent on the location within the dispersal area and if the individual distribution pipe is at the top or the bottom of the array. The system does not utilise all zones or pipes within zones consistently.

Most of the treated wastewater is discharged from the lower two sets of pipelines and the first three zones. Only at higher flows do all of the zones and pipelines provide discharge. Dependent on the position within the dispersal area, the average slope varies between approximately 10-14% with an average fall over the length of the dispersal area of approximately 10m. Following dispersal over land and through the vegetated discharge field and riparian plantings with some seepage, the discharge enters a reach of the tributary which has previously been dammed to create a pond (farm pond). This has created a gentle slope to the water's edge compared to the more steeply incised reaches of the stream both upstream and downstream of the pond. The overland flow system operates continuously/on demand without any controlled rest periods.

Figure 2-15: Beachlands WWTP Overland Flow Distribution Pipe

Figure 2-16: Beachlands WWTP Overland Flow Distribution Pipe

2.6 Alternatives Assessment Process

2.6.1 Background

Watercare proposed that the process to identify the preferred option for the future treatment and discharge needs to determine that the preferred option is the Best Practicable Option (**BPO**) as defined under the Resource Management Act 1991 (**RMA**).

The alternatives assessment that is summarised in this section is a technical assessment. The assessment is recorded in more detail in the Alternatives Assessment Report.

Watercare has undertaken separate consultation processes with Ngāi Tai ki Tāmaki and the Beachlands Maraetai community regarding options for the future treatment and discharge of the wastewater from Beachlands Maraetai. Feedback from these consultation processes has been integrated with this technical BPO assessment processes for Watercare to determine the preferred option for the future treatment and discharge of the wastewater.

The BPO assessment has responded to direction on alternatives assessment in the RMA, and in particular Section 105 and Schedule 4. The process also took into account the extensive body of case law that exists regarding the consideration of alternatives under the RMA, and the relevance of identifying the BPO noting the relevance of section 108(2)(e) of the RMA. In this respect, as an initial step in the BPO assessment process was the identification of key principles and best practice guidance for the assessment of alternatives. In the present context these include that assessment must be undertaken of:

a. any possible alternative locations or methods for undertaking the activity.

b. any possible alternative methods of discharge, including discharge into any other receiving environment.

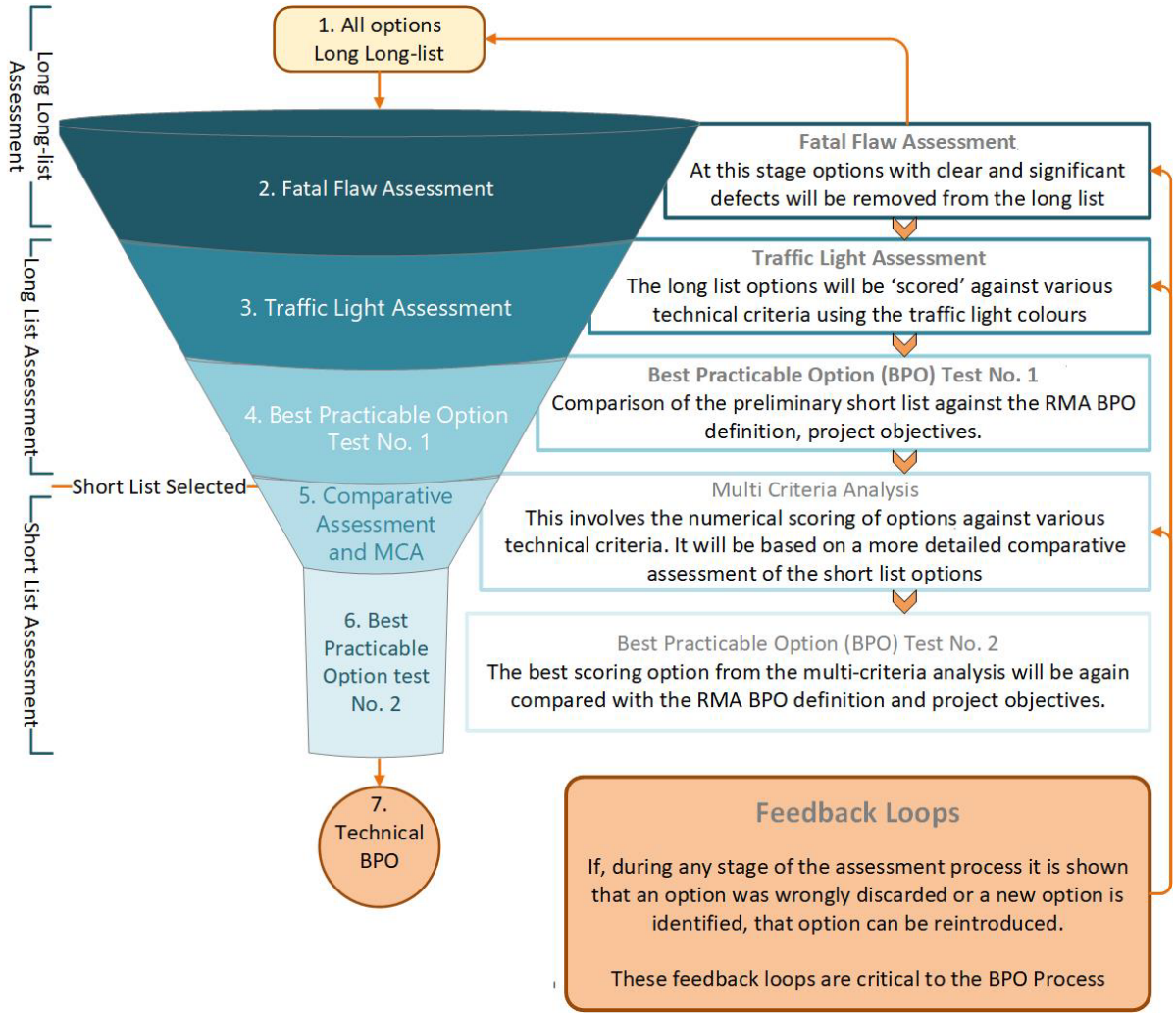
2.6.2 Methodology

The methodology designed for the technical BPO assessment is set out in the diagram below. It involves:

1. The development of a Long Long list of options.
2. Fatal Flaw assessment that removed options with significant defects from the Long Long list to identify a Long List of options.
3. Traffic Light assessment of the Long List of options to identify a preliminary Short List of options.
4. BPO Test No 1 to confirm the Short List of options.

5. Short List assessment to identify a preliminary technical preferred option / BPO.

6. BPO Test No 2 to confirm a technical preferred option / BPO.



2.6.3 Fatal Flaw Assessment

This involved assessing the Long Long List of 32 options against seven fatal flaw criteria. An option only had to meet one of the criteria to be fatally flawed. A total of 13 options were fatally flawed resulting in a Long List of 19 options. The options that were fatally flawed primarily involved the conveyance of raw, partially treated and fully treated wastewater to other Watercare wastewater treatment plants.

2.6.4 Traffic Light Assessment

The 19 Long List options taken forward for the traffic light assessment comprised options involving discharge to the tributary of the Te Puru Stream, options involving discharge to other freshwater bodies, options involving discharge to the Coastal Marine Area (**CMA**), options involving discharge to land and groundwater and options involving discharge to a combination of these receiving environments. The options also included a range of potable and non-potable reuse combinations including a supplementary supply for the Hunua Dams.

This stage of the assessment involved the development of assessment criteria (eight in total), technical expert assessment and traffic light scoring of each option against the criteria the experts were responsible for, and a Long List workshop that used the Traffic Light assessment to identify a preliminary Short List of options (five in total).

2.6.5 BPO Test No 1

This involved assessing the preliminary Short List of options against BPO criteria based on the RMA BPO definition and against the Project Objectives developed for the project. The BPO and objectives assessments were reasonably well aligned with the Short List Traffic Light assessment and did not identify any additional red traffic light scores which would direct an option to not be progressed for further consideration.

All five of the preliminary technical Short List of options passed the Best Practicable Option Test No. 1 and were taken forward to the Short List assessment stage.

2.6.6 Short List Assessment

The five options taken forward for the Short List assessment were:

- Diffuse discharge to the tributary of the Te Puru Stream.
- Direct discharge to the tributary of the Te Puru Stream.
- Discharge of 100% of the treated wastewater to land (approximately 750ha) in the vicinity of the WWTP.
- Combination of discharging the treated wastewater to land (approximately 300ha) in the vicinity of the WWTP during dry weather and a discharge to the tributary of the Te Puru Stream at other times.
- Discharge to the Hauraki Gulf north of Beachlands in the Tāmaki Strait via a 2.9km offshore ocean. outfall.

This stage of the assessment involved the technical expert assessment and 1 to 5 scoring (1 best 5 worst) of each option against the criteria they were responsible for, and multi-criteria assessment (**MCA**) workshops to identify a preliminary technical BPO.

2.6.7 BPO Test No. 2

This stage followed a similar process to the BPO Test No 1 and involved the BPO and Project Objectives assessment of the preliminary technical BPO in comparison with the other Short List Options. The BPO Test No 2 confirmed that the option involving the diffuse discharge to the tributary of the Te Puru Stream should be recommended to Watercare as the technical BPO.

2.7 Staging of Proposed Wastewater Treatment Plant

The proposed discharge will be undertaken in 4 stages over the 35-year consent term sought as shown in Table 2-2 and described below.

Table 2-2 Beachlands WWTP Design Discharge Flows

Parameter	Units	Existing WWTP		New WWTP	
		Current	Short-term Upgrade	Long Term Upgrade Stage 1	Long Term Upgrade Stage 2
Design population	P.E.	11,000	18,000	24,000	30,000
Annual average daily discharge flow	m^3/day	2,200	3,600	4,800	6,000
Maximum daily discharge flow	m^3/day	4,500*	8,700	28,900	36,200

* The current consent maximum daily discharge limit is 2,800 m^3.

2.7.1 Existing WWTP (Current)

This involves a treated wastewater discharge from the existing WWTP in its current form as described in section 2.4, prior to completion of the proposed Short-term upgrade.

The WWTP is currently operating at its design capacity and has limited ability to accept any additional growth. An upgrade is needed to alleviate this constraint, allowing housing developments and population growth to occur in the short term. The main elements of the Short-term upgrade are:

- Replacement of the existing inlet screen (which has reached the end of its useful life).
- Increasing the aeration capacity of the bioreactor lagoon.
- Installation of a new A recycle pumps and pipework.
- Installation of an additional tertiary filter.
- Installation of additional UV lamps.
- Increased pipework capacity from UV to extended overland flow area.
- Construction of additional sludge drying beds.
- Upgrade of mains power supply and distribution boards.
- Expansion of the existing overland flow area.

An aerial photograph showing the elements of the Short-term upgrade is presented in Figure 2-20.

This application seeks consent to increase the maximum daily discharge volume from 2,800 m^3 to 4,500 m^3 for the existing WWTP in its current form. This increased discharge volume is required to remedy the current ongoing non-compliances with the existing consent maximum discharge volume condition and reflects the level of inflow and infiltration in the network. Non-compliant flow volumes have occurred after sustained periods of heavy rain.

2.7.2 Existing WWTP (following Short-Term Upgrade)

This covers the WWTP discharge following the commissioning of the short-term upgrade described in the previous section, through to the commissioning of Stage 1 of the Long-term upgrade described in the following section. The treatment process for the Short-Term upgrade is identical to the current WWTP, but with increased capacity.

The Short-Term upgrade is based on a design of 18,000 PE which provides for projected population growth within the existing urban areas and for the initial development phase of PPC88, should this development be connected to the WWTP. This application seeks that the maximum daily discharge volume during this stage is set at 8,700 m^3.

Prior to reaching a catchment 18,000 PE, Watercare will construct the Stage 1 of the Long-term upgrade (new MBR treatment plant). Should development and population growth not occur at the projected rate, the construction of the new MBR treatment plant will be delayed.

2.7.3 New WWTP (following Long-term Upgrade Stages 1 and 2)

This is the discharge from the new WWTP following the commissioning of Stage 1 of the Long-term upgrade. The Long-term upgrade will be constructed in two stages (first stage capacity of 24,000 PE followed by a second stage taking the capacity to 30,000 PE) which Watercare expects will provide sufficient capacity out to approximately 2060 (see Section 2.7.6). The application seeks that the maximum daily discharge volume for Long-term stage 1 is set at 28,900 m^3 and for Long-term Stage 2 is set at 36,200 m^3. In addition, Watercare proposes to set treated wastewater concentration limits as described in Section 2.7.7 below.

The Long-term upgrade will involve construction of a new WWTP replacing the existing one, albeit using the same biological treatment process. The current bioreactor lagoon will be replaced with new concrete tanks termed activated sludge reactors (**ASR's**). The secondary clarifier and disc filters will be replaced by new ultrafiltration (**UF**) membrane bioreactors (**MBR's**). UF membranes have a nominal pore size of 0.04 microns (compared with the current cloth disc filter nominal pore size of 10 microns, i.e. 250 x smaller pore size). UF membranes remove 100% of suspended solids and most micro-organisms (bacteria, viruses and protozoa) from the treated wastewater, thereby providing disinfection as well as solids removal. Notwithstanding this, the UV disinfection system will be retained and expanded to provide an additional public health protection barrier. The main elements of the new WWTP are:

- New inlet works
- New ASR's
- New MBR's

- UV disinfection system (existing system expanded)
- New sludge handling facilities (thickening and dewatering)
- Expansion of the overland flow area

As noted in the previous section, transition to the Long-term upgrade will be based on an average daily flow trigger rather than a fixed timeframe. To ensure that this is met Watercare proposes to monitor and model average daily flows within the WWTP catchment and to annually report on it to Auckland Council. Once Watercare's monitoring and modelling indicates that population within the WWTP catchment will exceed the Short-term upgrade capacity within 6 years, it will initiate design and construction of the Long-term upgrade.

2.7.4 Site Layouts

Aerial photographs of the Beachlands WWTP showing the Short-term and Long-term stages are presented in Figure 2-17 and Figure 2-18:. Figure 2-18: presents a possible Long-term layout; this may change, or a completely new layout may be developed as the design progresses. However, those changes will not impact on the treated wastewater discharge quality for which consent is sought.

2.7.5 Long-term Stages 1 and 2 - Process Flow Diagram

A process flow diagram for the new MBR WWTP Long-term (Stages 1 and 2) is presented in Figure 2-19. As noted in section 2.7.2 above, the treatment process for the Short-term upgrade is the same as the existing process, so the process flow diagram is identical to the current WWTP (Figure 2-4).

Figure 2-17: Beachlands WWTP Short-Term Upgrade Indicative Site Layout

Figure 2-18: Beachlands WWTP Long-term Stage 1 & 2 Indicative Concept Site Layout

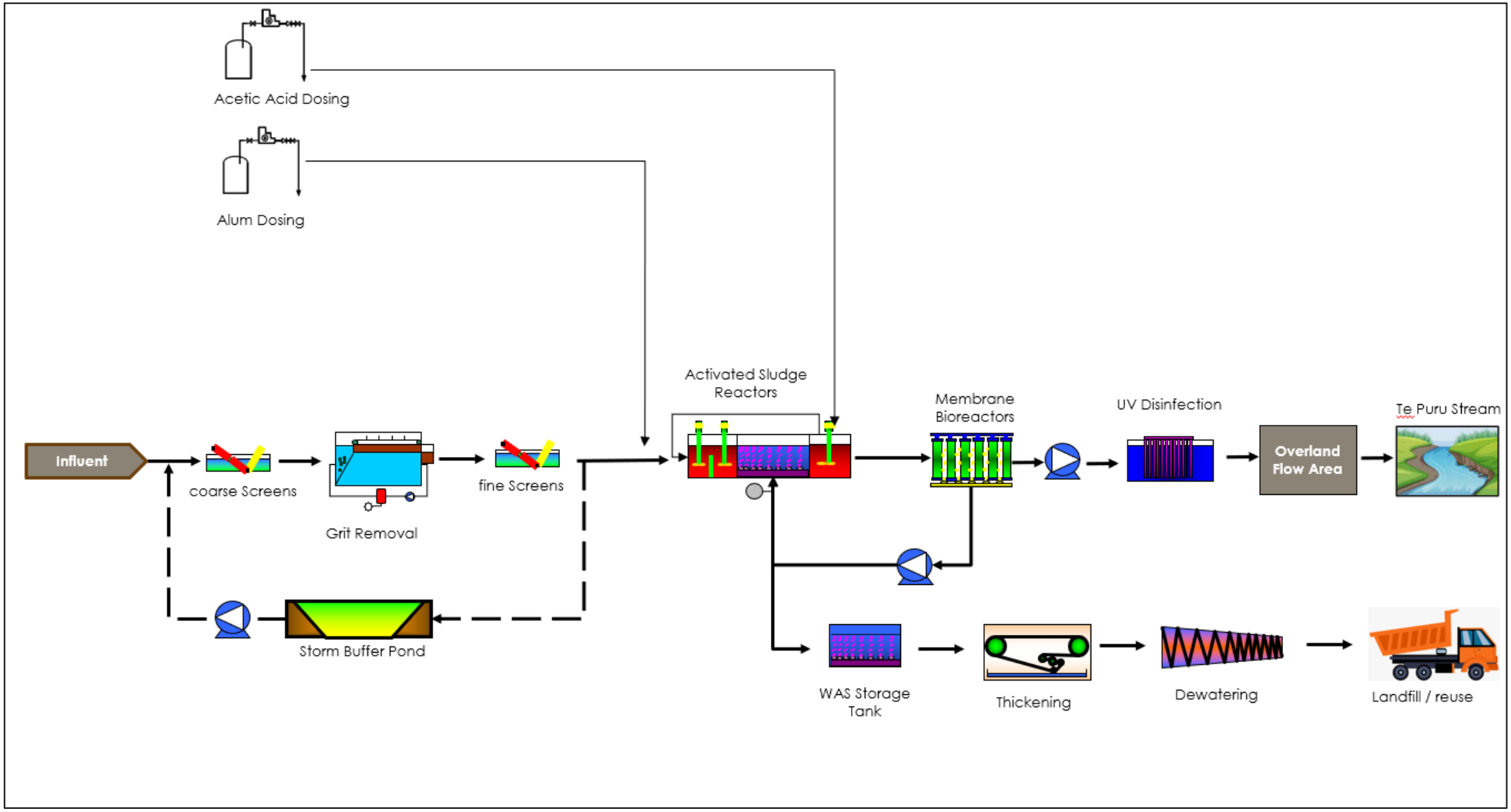


Figure 2-19: Beachlands WWTP Long-term Stage 1 and 2 Indicative Process Flow Diagram

2.7.6 WWTP Upgrade Staging

The timing of the upgrades based on the Servicing Strategy[4] population growth forecast is presented in Figure 2-20.

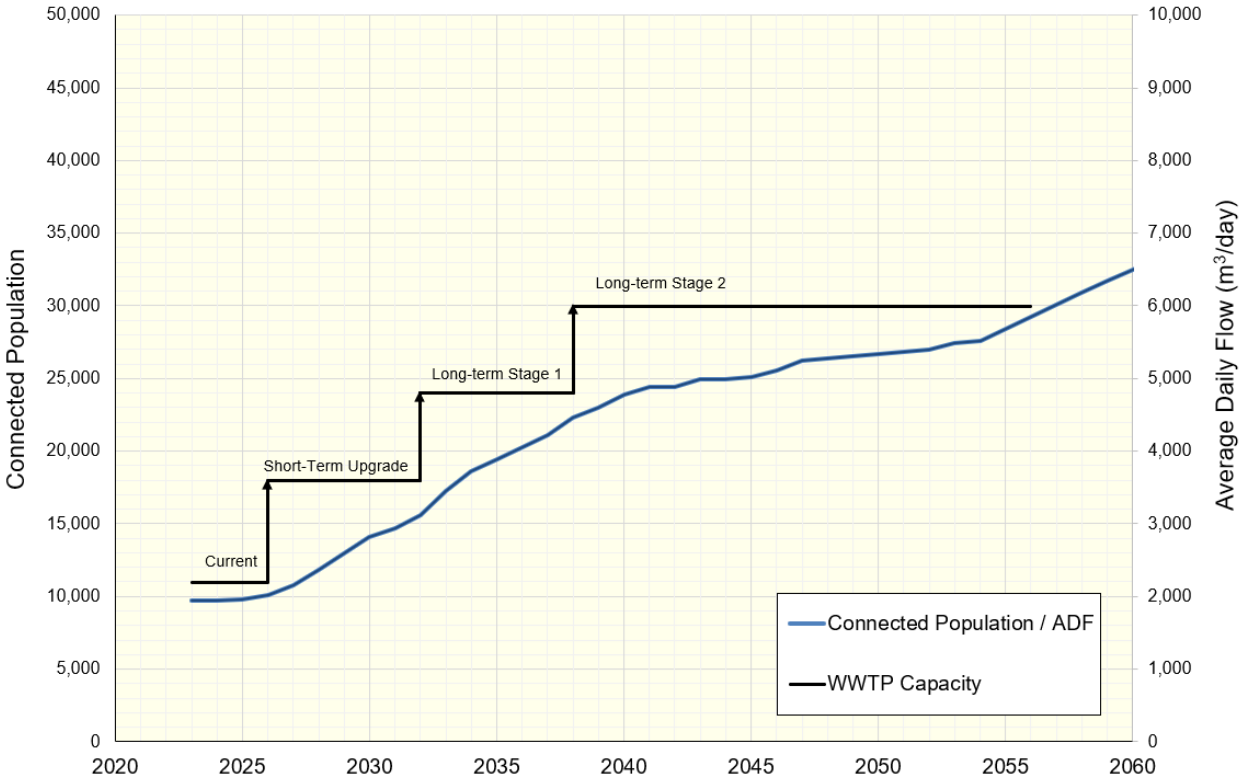


Figure 2-20: Beachlands WWTP Upgrade Staging and Forecast Population from Servicing Strategy

The following points should be noted regarding the WWTP staging: Figure 2-20: Beachlands WWTP Upgrade Staging and Forecast Population from Servicing Strategy

- As the WWTP is currently at its design capacity, the Short-term upgrade is required as soon as possible to avoid the WWTP restricting growth and housing developments within Beachlands-Maraetai. A commissioning date of December 2026 is considered a stretch but achievable target for this upgrade however to allow some contingency a latest date for completion of the Short-term upgrade is December 2031.
- As noted previously, the timing of the new WWTP Long-term Stage 1 upgrade will depend on future population growth. The timing shown in Figure 2-20 is the earliest date based on the population growth and assumes that the Private Plan Change 88 (PPC88) application is successful. If growth of Beachlands-Maraetai does not occur at the rate presented in Figure 2-20 then the Short-term upgrade operation will be extended and the new MBR WWTP design will be delayed until such time as the connected population approaches the Short-term design capacity.

2.7.7 Treated Wastewater Quality

Treated wastewater quality consent limits for the WWTP upgrades are presented in Table 2-3.

[4] Servicing Strategy for Beachlands, Maraetai and Whitford (Watercare, May 2023)

Table 2-3: Beachlands WWTP Treated Wastewater Quality Consent Limit Summary

Parameter	Units	Existing WWTP		New WWTP	
		Current and Short-term Upgrade		Long-term Stages 1 and 2	
		Median	95th %ile	Median	95th %ile
BOD	mg/L	7.0	15	5.0	9.0
TSS	mg/L	7.0	15	5.0	9.0
NH_4-N	mg/L	0.6	3.0	0.5	3.0
NO_x-N	mg/L	3.5	11	2.0	4.5
SIN	mg/L	4.1	14	2.5	7.5
DRP	mg/L	1.0	3.0	0.5	1.0
Faecal coliforms	cfu/100 mL	<10	100	<10	100

2.8 Wastewater Scheme Management

2.8.1 General Management Policies and Plans

The upgraded and new WWTP will be based on modern design and construction techniques. These will be integrated into Watercare's wastewater management and operation procedures, policies and plans. The following presents a summary of a number of these procedures, policies and plans.

2.8.1.1 Watercare's Statement of Intent

Watercare's Statement of Intent (**SOI**) sets the overall strategic direction and objectives for Watercare, to be achieved through the delivery of major projects such as the Beachlands WWTP. A key activity identified in the SOI for 2023 – 2026 is delivering safe and reliable water and wastewater services to Aucklanders 24 hours, seven days a week.

2.8.1.2 Strategic Planning

This project is part of Watercare's strategic planning approach, not only in terms of securing effective and efficient resource consents but also in providing wastewater servicing capacity to meet the current and future planned residential, business and industrial (trade waste) requirements.

2.8.1.3 Consent Compliance

Ensuring a high level of compliance with their resource consents is a key objective of Watercare. Watercare's annual report contains a number of performance measures related to compliance with wastewater discharge permit conditions. The current SOI sets a performance target of 100% of wastewater discharged from treatment plants complying with consent conditions. A high level of importance is attached to effective communication with officers of Auckland Council in respect of resource consent matters. Associated with consent compliance is the management of trade wastes in accordance with the Trade Waste Bylaw 2013 and individual trade waste agreements.

Section 2.4.2 of this AEE traverses the WWTP's resource consent compliance.

2.8.1.4 Asset Management

Watercare has a well-developed asset management planning approach and practice as set out in the Asset Management Plan 2021 - 2041 (**AMP**). The AMP is Watercare's tactical plan for managing the company's infrastructure cost-effectively to achieve long-term strategic goals. The plans outline 20-year forecasts of asset strategies and 10-year capital expenditure to achieve defined levels of service and performance standards.

Watercare is committed to best-practice asset management across the business. The aim is to align the asset management systems with the international standard ISO 55000:2018 - Asset Management System and follow the guidelines of the International Infrastructure Management Manual.

The Asset Management Policy outlines how Watercare plans, designs, constructs, acquires, maintains, operates, rehabilitates and disposes of their assets. Watercare keeps in mind both present and future customers by considering the assets in a manner that:

- Protects the public health of the community and provides a defined level of service to customers.
- Takes an asset life-cycle approach.
- Develops cost-effective management strategies for the long term, including optimising the cost of maintaining and operating networks.
- Manages risks associated with asset failure.
- Uses physical resources sustainably and cares for the natural environment.
- Continuously monitors and improves asset performance and management practices.

Watercare's high-level asset management objectives are as follows:

- To operate and maintain the water and wastewater systems in an efficient manner.
- To ensure there is sufficient infrastructural capacity to meet growth in demand.
- To meet regulatory requirements and levels of service.
- To replace assets as they reach the end of their economic lives.
- To respond and adapt to climate change.

Watercare's Wastewater-specific principles are as follows:

- Wastewater treatment plant capacity will be augmented to match growth in demand and to maintain compliance with the facilities' discharge consents.
- Augmentation of the wastewater transmission and local networks will be carried out prior to the peak dry-weather flow exceeding the capacity of the network and in accordance with discharge consent conditions.
- It is recognised that the network discharge consent sets the performance standard for the wastewater network and the investment required.
- Cross-connections from the stormwater system to the separated wastewater network are not permitted.
- The wastewater system is for the conveyance of wastewater only; therefore, as much as practical, stormwater and groundwater will be diverted from the system.
- An inflow and infiltration (I&I) reduction programme will be progressed and enhanced to maximise the use of existing assets.
- As the transmission system reaches capacity, Watercare will augment the interceptors by truncating the catchment or diverting flow to an adjacent interceptor.
- High-risk rising mains and inverted siphons will be duplicated to provide redundancy.
- Wastewater treatment plants will be regarded as 'resource recovery plants'. This means that, where possible and practicable, energy, biosolids and other resources will be beneficially reused.

In support of infrastructure delivery, Watercare has dedicated resources tasked with the development and maintenance of a dedicated organizational technical standards framework; known as the Engineering Standards Framework. This contains design guidelines to ensure adequate levels of design and construction quality to achieve the asset management principles in the plan.

Key components are:

- Appropriate materials of construction.
- Approved equipment vendors.
- Construction standards.

- Equipment redundancy policies:
  - Spare (n-1) treatment units in-site to continue operation in the case of failure.
  - Stand-by power generation in the case of electricity grid interruptions.
  - Spares held in Mangere Watercare Stores common to all sites to quickly supply common spares when required.

2.8.2 Trade Waste Management

Trade waste is regulated by the Trade Waste Bylaw 2013 which puts in place procedures to manage the risk of trade wastes discharges to the wastewater network. Watercare has delegated authority from Auckland Council to administer and enforce this Bylaw and any related trade waste controls. Any potential wet industries producing significant industrial/trade waste wastewater wishing to connect to the Beachlands WWTP would need to enter into a Trade Waste Agreement (**TWA**) with Watercare to discharge into the system via Auckland Council's Trade Waste Bylaw; no such industries are anticipated at the present time.

Before entering into a TWA Watercare ensures that the network and WWTP have capacity for the volume and flow rate requested. If capacity is available, Watercare carries out risk assessments on the characteristics of the discharge to determine the necessary terms of the TWA; and to set up an appropriate monitoring programme for the site. This includes assessing the adequacy of the pre-treatment processes in place and their maintenance and requesting improvements to trade waste management as necessary.

Within the Beachlands WWTP catchment the Pine Harbour Water Treatment Plant has a TWA to discharge wastewater from the regeneration of their ion exchange cartridges. This is currently the highest risk trade waste in the catchment. Other trade waste discharges in the catchment are classified as lower risk and do not need a TWA with specific conditions. Examples of these activities include cafes, shops, hairdressers, car wash facilities etc.

2.8.3 Operation and Management Procedures

The Beachlands WWTP currently has an Operation and Maintenance Manual (**O & M Manual**). Watercare updates this manual as necessary to cover changes to operating and maintenance requirements resulting from plant upgrades. The O & M Manual will need to be updated when the WWTP is upgraded and the new WWTP developed.

2.8.4 Management of Biosolids and other Residuals

Currently biosolids produced by the WWTP are stabilised in two sludge lagoons over the winter months and dried on sand drying beds over summer prior to trucking the dried biosolids to Hampton Downs Landfill.

The current biosolids management system will be maintained following the Short-term upgrade. For the Long-term upgrade, new biosolids handling facilities will be constructed to replace the lagoons and drying beds. It is expected that the new facilities will include a waste activated storage tank, followed by mechanical thickening and dewatering of the sludge. Dewatered sludge cake will be trucked to landfill in covered bins.

2.8.5 Stormwater Management

Stormwater management on the WWTP site is subject to Discharge Permit # 33614 which authorises the diversion and discharge of stormwater from 2,900m^2 of new impervious surface that was created as part of the WWTP upgrade in 2009.

Stormwater flows from the impervious surfaces at the site are diverted and discharged to a 215m long and 2m wide grass swale which provides water quality treatment prior to discharge to a tributary of the Te Puru Stream.

Planting as required by Discharge Permit # 33614 has been carried out over 1.7ha which was put in place instead of attenuating the ten-year storm event (10 year ARI) and providing extended detention. The planting is a mix of riparian planting and native revegetation of pasture and exotic planting. Operations and Maintenance are carried out in accordance with an Operations and Maintenance Plan and compliance is reported on the WWTP Annual Report.

2.8.6 Climate Change and Natural Hazards

The extensive alternatives assessment included a resilience assessment criterion that includes natural hazards and climate change. All the options were assessed against this criterion in the determination of the technical BPO. This assessment included addressing the carbon component of Watercare's 40:20:20 policy.

The 40:20:20 goal represents Watercare's commitment to the environment, its workforce, and its customers. The numbers stand for a 40% reduction in construction carbon emissions, 20% reduction in construction costs, and 20% yearly improvement in wellbeing, health and safety.

Climate change has been factored into the design wet weather flows in this application so that the upgraded WWTP will be able to remain operational and treat wet weather flows during extreme wet weather events such as occurred in the Auckland Anniversary floods of 2023.

3. Description of Receiving Environments

3.1 Existing Environment

As the current discharge is to be re-consented it cannot be treated as forming part of the existing environment beyond the term of the existing consent. Therefore, any effects assessment cannot include effects resulting from the exercise of the current consent. The baseline against which effects must be assessed is the environment without the current consented discharge occurring. In the case of a freshwater discharge, the best guide to the existing environment without the discharge occurring is the existing environment in the freshwater body upstream of and unaffected by the current discharge. This principle has been established through case law.

While the current discharge is not part of the existing environment, it is discussed in the application because it provides crucial context to the application. The current discharge can be referenced in the effects assessment as a point of comparison with the proposed discharge.

3.2 Cultural Setting Ngāi Tai Ki Tāmaki

The Beachlands Wastewater Scheme is within the rohe of Ngāi Tai Ki Tāmaki and sits within their Statutory Acknowledgement Area which has been identified and described in Ngāi Tai Ki Tāmaki Claims Settlement Act 2018 and the AUP.

In respect to their cultural setting and aspirations, Ngāi Tai Ki Tāmaki has recently published *'Ngāi Tai Ki Tāmaki Take Taiaomaurikura – September 2022'* which sets out the expectations and actions to protect and restore the Mauri of Te Taiao in the rohe of Ngāi Tai ki Tāmaki.

Ngāi Tai Ki Tāmaki Claims Settlement Act 2018 contains statements of association which help to provide an insight into the cultural setting of the Beachlands area[5]. Locations that are described and that are relevant to the WWTP and the discharge to a tributary of the Te Puru Stream are the Coastal Marine Area, the Hauraki Gulf/Tikapa Moana and Whakakaiwhara ki Umupuia ki Maraetai ki Okokino. Noting that this needs to be confirmed by Ngāi Tai Ki Tāmaki.

Ngāi Tai ki Tāmaki and Watercare are continuing to engage and are working together to develop a cultural statement for the project.

Ngāi Tai ki Tāmaki have communicated that they wish to formally respond the application by way of a cultural statement however, this will occur following lodgement of the application.

3.3 Overland Flow Area

While the current WWTP is in operation, the proposal will involve the continued discharge of treated wastewater to a tributary of Te Puru Stream via the existing overland flow area. Following the short-term and Long-term upgrades, the discharge will occur via an expanded overland flow area. The expansion of the overland flow system will commence as part of the Short-term upgrade, and the area will be further expanded as part of each of the Long-term upgrades.

The existing overland flow area (shown in Figure 3-1 and location identified in Figure 3-2) is located to the south of the WWTP, immediately adjoining the farm pond within the tributary of Te Puru Stream. The existing overland flow area is approximately 1.5 hectares and has an average slope of approximately 10-14% with an average fall over the length of the dispersal area of approximately 10 m. The upper portion of the overland flow area contains the treated wastewater dispersion infrastructure and the length of the overland flow area below the dispersion infrastructure ranges from approximately 50 to 100 m.

As shown in Figure 3-2, the existing overland flow area is part of a significant ecological area (SEA) identified in the AUP. This is SEA_T_428 which has been identified as being significant because of its threat status, rarity and diversity. The area is fenced and contains a mix of exotic and indigenous vegetation. The SEA connects to SEA_T_5259 (a larger contiguous area of complex native vegetation, including regenerating and semi-mature native forest). Despite the AUP SEA

[5] Appendix 21 to the Auckland Unitary Plan, Treaty Settlement Legislation – Statutory Acknowledgements

classification, PDP has identified[6] that the existing overland flow area and farm pond, are not natural ecosystems and do not meet the SEA or natural wetland criteria.

In an 'Assessment of Overland Flow System Treatment Performance – Memorandum 3 (Interim)' PDP identifies characteristics of the existing overland flow area that impact its performance. These include higher flow rate to some zones within the overland flow area, uneven distribution of the wastewater across the slope and associated channelisation of the flow. These limitations with the existing overland flow area will be addressed under the conditions of the consent being sought in this application (see section 10.5 below).

In a 'Preliminary assessment of land area requirements for overland flow system expansion' PDP has identified three feasible additional overland flow areas within the land owned by Watercare. These are areas A, B1 and B2 on Figure 3-2. Of these three areas PDP has identified area B2 as preferred and Watercare proposes to adopt this recommendation. While the topography within area B2 varies, PDP has identified that it contains sufficient land with a slope ranging from 2-12% to make it feasible for the WWTP's expanded overland flow system.

Area B2 is covered with exotic grassland, and the riparian margin of the adjoining stream is dominated by indigenous shrubland, but also includes regional pest plant species such as crack willow and grey willow. Wetlands have also been identified in gullies and the riparian margins adjoining area B2. The riparian margins adjoining B2, although not area itself, are identified as part of SEA_T_428 in the AUP.

It is proposed that the final area, location and design of the additional overland flow areas will be determined under conditions of the resource consent. Further details on this proposal are provided in Section 10.5 below.

[6] See 'Assessment of Potential Effects on Soils and Ecology from Beachlands WWTP Overland Flow System (Memorandum 4)'

Figure 3-1: Overland Flow Area feed pipes (top) and farm pond (bottom)

(Source: Stewart, M., James, M., and Sim-Smith, C. (2024) Beachlands Wastewater Treatment Plant – ecological and human health effects assessment. Report WSL2303–D1, Streamlined Environmental)

Figure 3-2: Location of existing and potential overland flow areas

(Source: Beachlands WWTP: Preliminary assessment of land area requirements for overland flow system expansion – Memorandum 1, PDP, 22 March 2024)

3.4 Te Puru Stream and Tributaries

3.4.1 Catchment Overview

The WWTP is located in the headwaters of the Te Puru Stream which flows to Te Maraetai / Kellys Beach on the eastern side of Te Puru Park and the inter-tidal flats of Te Maraetai / Kellys Beach (see Figure 3-3). The stream catchment contains low relief, mainly in dairy and sheep pasture, with areas of exotic forestry on open land and regenerating native bush in stream gullies and some open slopes. The lower reaches of the stream have a wide range of saline habitats including mangroves, raupō and Scirpus sedgeland. The stream reach within the WWTP site has a grade of approximately 2–4%.

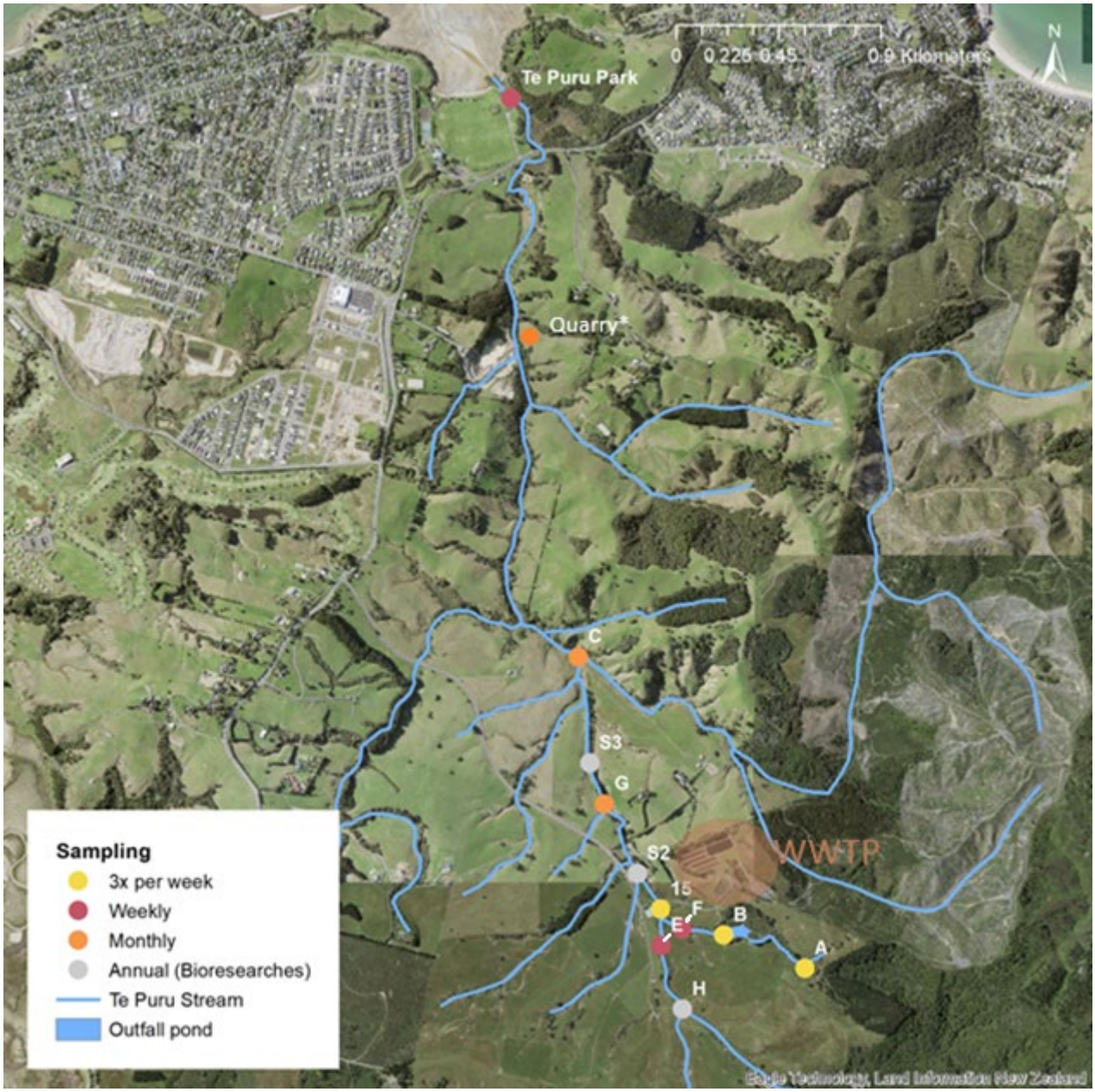


Figure 3-3: Location of the Beachlands WWTP (brown oval) within the Te Puru catchment, showing water quality and annual ecology monitoring sites[7]

[7] Stewart, M., James, M., and Sim-Smith, C. (2024). Beachlands Wastewater Treatment Plant – water quality, ecological and human health effects assessment. Report WSL2303–F2, Streamlined Environmental (hereafter 'Stewart et al')

3.4.2 Hydrology and Hydrodynamics

Te Puru Stream involves a series of tributaries joining the main stem at various locations above and below the wastewater discharge. The entrance of Te Puru Stream to the estuary is over a riffle section of steeply inclined stream bed at all tidal stages, clearly defining the upper limit of saline influence to below the Quarry site.

Between 2019 and 2023 annual rainfall within the catchment ranged from 867 mm to 1803 mm, with an average of 1272 mm. 2023 was the wettest year with 1803mm of rain (average of 150mm per month). In comparison, October 2023 (66mm), January 2024 (57mm), and February 2024 (6mm) were particularly dry months.

Flow in Te Puru Stream is highly dependent on rainfall. However, once effects of rainfall runoff have cleared, it is estimated that the farm pond, into which the WWTP discharges from the overland flow area, contributes around 20% of the total flow at the downstream Quarry site[8].

The hydrodynamics of Te Maraetai / Kellys Beach change significantly depending on the tides due to the large area of inter-tidal flat. At low tide the lowest levels of dilution occur along the sub-tidal channel but will be along the waterline on the incoming tide. At high tide the dilution is lowest at the eastern end of the beach and highest at the western end.

3.4.3 Water and Sediment Quality State

Table 3-1 compares the results from water quality monitoring within Te Puru Stream with relevant guideline values[9]. The locations of the monitoring sites are shown on Figure 3-3 above. As noted in Section 3.1, the monitoring sites upstream of the WWTP discharge (sites A and E in Exceedances of Auckland Council (AC) and ANZG (2018) guidelines and NPS-FM national bottom line (NBL) are bolded red. Results from sites indicative of the existing environment are shaded grey.

Table 3-1) are indicative of the 'existing environment', while data from the downstream monitoring sites provides important context for consideration of the proposed discharges. The data shows that:

- Water in Te Puru Stream is generally well oxygenated, with dissolved oxygen (**DO**) similar upstream and downstream of the WWTP.
- Water temperature is above guideline levels at all sites and slightly elevated at downstream sites relative to upstream sites.
- Low pH appears to be more an issue than high pH in the receiving environment and appears to be driven by the upstream farm pond, not the WWTP discharge.
- Biochemical oxygen demand (**$cBOD_5$**) is at low concentrations and similar upstream and downstream of the WWTP discharge.
- Conductivity at all sites is above Australian and New Zealand Guidelines (**ANZG**) 95% default guideline values (**DGV**) and there is a clear influence of the WWTP discharge on conductivity in sites downstream.
- There was no evidence of any significant salinity ingress into the WWTP (influent maximum 2.4 parts per thousand (**ppt**) and discharge maximum 1.4 ppt), or any receiving environment site upstream of Te Puru Park.
- Total suspended solids (**TSS**) and turbidity are low and at similar concentrations in receiving environment sites upstream of the Quarry site and unrelated to the WWTP discharge.
- Nitrogen concentrations are elevated at sites downstream of the WWTP discharge relative to concentrations observed upstream. Ammoniacal-N and nitrate-N concentrations upstream of the WWTP discharge place them in National Policy Statement for Freshwater Management (**NPS-FM**) attribute band A for toxicity. Whereas downstream, after the potential mixing zone for the WWTP discharge (at Bridge site (15)) Ammoniacal-N and nitrate-N concentrations place them in NPS-FM attribute band B for toxicity. Dissolved inorganic nitrogen (**DIN**) at the same site is above levels that would be expected to contribute to eutrophication and is higher than at the upstream sites.
- Phosphorus shows a similar pattern to nitrogen with concentrations upstream meeting guideline values, while concentrations at sites downstream are higher and do not meet guideline values.

[8] See section 4.3 of Stewart et al.

[9] See section 4.4.1 of Stewart et al for explanation of the guideline values selected.

- Chlorophyll a is not measured in the influent or discharge. Concentrations are slightly elevated at the farm pond and farm pond downstream site, but back to upstream levels by the Bridge site.
- Bacteria – *Escherichia coli (***E. coli**), Faecal Coliform (**FC**), and enterococci – concentrations are higher upstream of the WWTP discharge, suggesting catchment sources dominate. E.coli concentrations do not meet guideline values at any of the sites in the catchment.

Water and surficial sediment samples at sites A (upstream pond), B (farm pond) and 15 (bridge) have been analysed for metal concentrations. The results show that all metal concentrations measured were below the applicable ANZG 95% DGV[10]. The surficial sediment samples were also analysed for phosphorous. The results indicate that sediment phosphorous is higher at Bridge site 15, although it is noted that earlier studies indicate that sediment phosphorous is relative static over decadal timeframes which suggests the farm pond, into which the WWTP discharges via the overland flow area, has the capacity to absorb phosphorous in the water column.

Finally, pharmaceutical and personal care products (**PPCPs**) (a subset of emerging organic contaminants (**EOCs**)) were sampled at the same three sites in November 2023[11]. Upstream of the WWTP discharge, at site A, PPCPs were mostly below detection limits. However low levels of wastewater markers (e.g. caffeine) were detected indicating the presence of wastewater upstream of the WWTP discharge, most likely from septic tanks. Results for sites B and 15 showed that the farm pond concentrations were consistently higher than site 15. These results indicate that an average attenuation of PPCPs of 2.9-fold is achieved by the overland flow system and farm pond.

3.4.3.1 Temporal Trends

Table 3-2 provides results from a temporal trend analysis that was undertaken on water quality data from the upstream farm pond (A) and farm pond (B) sites from February 2020 to March 2023. The parameters included in the analysis are only those likely to be impacted by the WWTP discharge, namely water temperature, ammoniacal-N, nitrate-N, Total Phosphorous (**TP**), and DRP. For the upstream farm pond (A) site there were no significant trends for all parameters, suggesting changes to catchment land use that may affect water quality at this site are not occurring on this time scale. For the farm pond into which the WWTP discharges via the overland flow area (site B) there was a statistically significant and meaningful increase in nitrate-N. All other trends were not statistically significant. The increase in nitrate-N observed at site B is consistent with an increase in nitrate-N in the WWTP discharge since 2020 (see Figure 2-11 above).

As noted in Section 2.4.3, the increase in nitrate-N in the discharge is the result of Watercare optimising their chemical dosing strategies. Figure 2-11 illustrates that during this period the plant continued to perform well below consented limits so there was scope to adjust chemical dosing rates and reduce operating costs.

[10] See Table 10 and Figure 27 in Stewart et all, 2024.
[11] For further detail, see section 4.4.1.5 of Stewart et all, 2024

Exceedances of Auckland Council (AC) and ANZG (2018) guidelines and NPS-FM national bottom line (NBL) are bolded red[12]. Results from sites indicative of the existing environment are shaded grey.

Table 3-1: Comparison of receiving environment water quality parameters from September 2023 to January 2024 with applicable guideline

Site/Parameter		WWTP Inlet	WWTP Outlet	Upstream Farm Pond (A)	Farm Pond (B)	Farm Pond downstream (F)	Bridge (15)	Tributary upstream (E)	Quarry	Te Puru Park[1]	Statistic	Guideline Value	Source[2]
Number of data	N	57	58	57	57	19	58	19	11	19			
DO	mg/L	0.1	0.8	**1.2**	**3.6**	7.4	5.2	5.9	7.0	5.6	1-day minimum (summer)[3]	4.0	NPS-FM NBL
Temperature	°C	23.0	25.7	**22.3**	**25.4**	**25.5**	**23.2**	**21.6**	**21.9**	23.3	Maximum (summer)[3]	17.7	AC
pH	unitless	7.40	7.30	6.80	7.50	7.70	7.40	7.24	7.50	7.74	80th %ile	7.70	ANZG WWLE[13]
pH	unitless	7.10	7.04	**6.60**	**7.20**	7.56	**7.20**	**7.00**	**7.10**	7.26	20th %ile	7.26	ANZG WWLE
$cBOD_5$	mg/L	230	5.7	1.1	1.1	1.1	0.7	0.5	0.9	0.7	Median	No guideline	
Volatile Solids	mg/L	237	7.0	4.6	5.2	6.0	4.9	4.4	11.6	10.4	Median	No guideline	
Conductivity	µS/cm	2,442	2,072	**213**	**1,552**	**1,236**	**965**	**176**	**557**	18,760	80th %ile	115	ANZG WWLE
Salinity	ppt	0.9	0.7	0.1	0.6	0.6	0.3	0.1	0.2	5.6	Median	No guideline	
TSS	mg/L	395	10.2	**12.4**	**12.0**	**13.9**	**9.5**	8.3	**50.8**	66.0	80th %ile	8.8	ANZG WWLE
Turbidity	NTU	160	2.0	**15.0**	**7.0**	**6.2**	**10.4**	**13.4**	**60.0**	55.0	80th %ile	5.2	ANZG WWLE
TN	mg/L	71.0	7.3	0.23	**4.6**	**4.7**	**2.4**	**0.31**	**1.10**	1.10	80th %ile	0.292	ANZG WWLE
NH_4-N (Attribute Band)	mg/L	51.5	0.38	0.03	**0.29**	0.21	0.07	0.02	0.04	0.04	Median	0.24	NPS-FM NBL
		NA	NA	(A)	**(C)**	(B)	(B)	(A)	(B)	NA			

[12] Source: Stewart et al

[13] WWLE = warm-wet low elevation

Site/Parameter		WWTP Inlet	WWTP Outlet	Upstream Farm Pond (A)	Farm Pond (B)	Farm Pond downstream (F)	Bridge (15)	Tributary upstream (E)	Quarry	Te Puru Park[1]	Statistic	Guideline Value	Source[2]
NH_4-N (Attribute Band)	mg/L	63.1	0.04	0.05	**0.48**	0.35	0.24	0.03	0.10	0.22	95th %ile	0.40	NPS-FM NBL
		NA	NA	(A)	**(C)**	(B)	(B)	(A)	(B)	NA			
NO_3-N (Attribute Band)	mg/L	0.02	5.1	0.02	**2.8**	**3.2**	1.6	0.1	0.6	0.5	Median	2.4	NPS-FM NBL
		NA	NA	(A)	**(C)**	**(C)**	(B)	(A)	(A)	NA			
NO_3-N (Attribute Band)	mg/L	1.3	6.4	0.1	**3.8**	**3.8**	2.1	0.1	0.9	0.8	95th %ile	3.5	NPS-FM NBL
		NA	NA	(A)	**(C)**	**(C)**	(B)	(A)	(A)	NA			
NO_2-N	mg/L	0.020	0.020	0.002	0.002	0.002	0.002	0.002	0.002	0.002	Median	No guideline	
DIN (mg/L)	mg/L	52.67	5.52	0.05	**3.19**	**3.42**	**1.72**	0.14	0.47	0.54	Median	1.00	SRC[14]
TP	mg/L	9.07	1.12	**0.045**	**0.580**	**0.596**	**0.297**	**0.030**	**0.100**	0.087	80th %ile	0.024	ANZG WWLE
DRP[4] (Attribute Band)	mg/L	4.92	0.73	0.014	**0.374**	**0.370**	**0.182**	0.014	**0.034**	0.027	Median	0.018	NPS-FM
		NA	NA	(C)	**(D)**	**(D)**	**(D)**	(C)	**(D)**	NA			
DRP[4] (Attribute Band)	mg/L	6.51	1.09	0.026	**0.499**	**0.503**	**0.251**	0.026	**0.066**	0.046	95th %ile	0.054	NPS-FM NBL
		NA	NA	(B)	**(D)**	**(D)**	**(D)**	(B)	**(D)**	NA			
Chla	mg/L	ND	ND	0.0009	0.0019	0.0023	0.0007	0.0006	0.0018	0.0014	Median	No guideline	
E. Coli	cfu/100mL	4,800,000	2	**1,250**	**510**	**540**	**540**	**930**	**480**	530	Median	130	NPS-FM NBL
E. Coli	cfu/100mL	10,200,000	17	**4,815**	**2,460**	**1,530**	**3,415**	**3,780**	**2,650**	6,320	95th %ile	1200	NPS-FM NBL
FC	cfu/100mL	8,200,000	2	1,750	650	770	715	1,300	590	690	Median	No guideline	
Enterococci	cfu/100mL	1,400,000	2	97	86	130	230	480	365	110	Median	No guideline	

[14] Southland Regional Council

Table 3-2: Summary of analysis of trends for selected parameters between 2020 and 2023 for upstream farm pond and farm pond sites[15]

Site	Parameter	Unit	Method	Seasonal variation	Mean	Max	Min	Median	Kendall statistic	P	Median annual slope	Percent annual change	Likelihood	Trend direction and confidence
Upstream	Temperature	°C	Seasonal Kendall	0.000	17.3	22.7	12.9	16.9	0	1.000	0.033	0.2	0.500	No detectable trend
Upstream	NH_4-N	mg/L	Mann-Kendall	0.633	0.40	0.40	0.40	0.40	0	1.000	0.000	0.0	0.500	No detectable trend
Upstream	NO_3-N	mg/L	Seasonal Kendall	0.014	0.04	0.16	0.02	0.02	-1	1.000	0.000	0.0	0.876	Trend exceptionally unlikely
Upstream	TP	mg/L	Mann-Kendall	0.124	0.09	0.18	0.02	0.07	5	0.856	0.000	0.0	0.572	Trend unlikely
Upstream	DRP	mg/L	Mann-Kendall	0.075	0.025	0.050	0.010	0.023	-3	0.927	0.000	0.0	0.573	Trend extremely unlikely
Downstream	Temperature	°C	Seasonal Kendall	0.000	18.2	23.1	12.6	18.3	0	1.000	0.054	0.3	0.500	No detectable trend
Downstream	NH_4-N	mg/L	Seasonal Kendall	0.032	0.40	0.43	0.40	0.40	1	1.000	0.000	0.0	0.500	Trend exceptionally unlikely
Downstream	NO_3-N	mg/L	Mann-Kendall	0.918	1.57	3.12	0.02	1.68	70	0.002	0.716	42.7	0.999	Increasing trend virtually certain
Downstream	TP	mg/L	Seasonal Kendall	0.010	0.33	0.56	0.10	0.35	1	1.000	0.082	23.3	0.549	Trend exceptionally unlikely
Downstream	DRP	mg/L	Seasonal Kendall	0.006	0.201	0.330	0.030	0.228	3	0.371	0.049	21.6	0.831	Increasing trend about as likely as not

[15] Source: Appendix 2 of Stewart et al, 2024

3.4.4 Freshwater Ecology

Data on the ecology of Te Puru Stream has been collected on behalf of Watercare from stream monitoring at sites H and E (upstream / reference sites), A and F (farm pond tributary) and S2, G, S3 and C (Te Puru Stream tributary) on several occasions since 2016 (see Figure 3-3 for the location of this sampling sites)[16].

Results from the recent 2024 survey indicate that:

- Macrophyte diversity and the percentage of macrophyte and algae cover generally increased downstream of the discharge.
- With respect to macroinvertebrates:
  - There were higher numbers of species at the upstream sites, while species numbers in the downstream sites increase with distance from the WWTP discharge.
  - The percentage of sensitive species (**%EPT**) ranged from 22-30% at upstream sites, with either no EPT or virtually 0% EPT at downstream sites.
  - Upstream sites were on the border between 'good' and 'fair' in the Macroinvertebrate Community Index (**MCI**), and above the **AUP** minimum of 94 for rural areas. Downstream sites were in 'fair' and 'poor' MCI categories, and below the AUP minimum for rural areas.
  - The Semi-Quantitative Macroinvertebrate Community Index (**SQMCI**) showed similar results to MCI with upstream sites in the 'fair' or 'excellent' category, and above the NPS-FM NBL of 4.5, and downstream sites in the 'poor' or 'fair' category, but with only site F below the NPS-FM NBL of 4.5.
  - It is considered that the poor macroinvertebrate scores downstream of the discharge are likely to be due to a combination of stressors, including the existing WWTP discharge, decreased riparian vegetation and hard substrate.
- Native fish species abundance and diversity was higher at upstream than downstream sites, with upstream sites rating 'poor' or 'fair' and downstream sites 'very poor' or 'poor' under the Fish Index of Biotic Integrity (**IBI**).

Overall, the survey indicates that at present the Stream is subject to moderate adverse ecological effects. The existing WWTP discharge contributes to these adverse effects as do catchment land uses and other stressors, e.g. limited riparian planting and the nature of the stream substrate.

Analysis of temporal trends over 2016 to 2024 indicates that:

- For most sites the number of macrophyte and algae taxa appear to be stable or increasing since 2016, with generally more taxa recorded at downstream sites. A similar trend is noted for percentage macrophyte/algae cover.
- For macroinvertebrates:
  - Number of taxa appear to be stable or declining at the upstream sites and generally lower but stable or increasing at the downstream sites.
  - %EPT has remained very low and between 0% and 3% for downstream sites.
  - MCI scores for upstream sites have been relatively consistent and mostly above the AUP minimum for rural areas of 94. Whereas MCI scores for downstream sites while generally consistent have been below the AUP minimum for rural areas in almost all instances.
- With respect to native fish:
  - Numbers of species were generally low (1-5) for upstream sites and 0-4 for downstream sites with no apparent temporal trends were observed.
  - The number of native fish at upstream site H was declining from 2016 (38) to 2022 (14) but returned to near 2016 numbers in 2024 (36). Upstream sites E and A showed a general increase in the number of native fish.

[16] Information on the approach to sampling and analysis of the data is provided in section 4.6.1 of Stewart et al, 2024.

Of the downstream sites, site F had consistently very low numbers of native fish, while the numbers of native fish at other downstream sites varied.

- Fish IBI appears to be reducing at upstream site H, but stable or increasing at sites E and A. For downstream sites, site F has either no fish or a very low Fish IBI, while sites S2 and G appear to be generally improving.

3.5 Coastal Marine Area

For the purposes of this application the existing coastal and marine environment has been assessed at the following scales:

- Te Maraetai / Kellys Beach and entrance of Te Puru Stream
- Adjoining coastal area of Beachlands and Maraetai
- Adjoining offshore marine environment (Tamaki Strait)

An extract from the relevant NZ topographic map series 50 showing the general area of the assessment is included in Figure 3-4.

3.5.1 Te Maraetai / Kellys Beach & Te Puru Stream entrance

Te Puru Stream enters the marine coastal environment at Te Maraetai / Kellys Beach, which is located approximately midway between Beachlands and Maraetai. The lower, estuarine reaches of Te Puru Stream are strongly influenced by seawater inflow during high tide, with salinities of 20–35 ppt at high tide but decreasing to 5–15 ppt during low tide. The entrance to Te Puru Stream is identified as a Significant Ecological Area–Marine 1 (SEA-M1-42b) in the AUP due to the variety of saline vegetation and coastal vegetation present and the intact ecological sequence from estuarine to freshwater wetlands (see Figure 3-5). In addition, Te Maraetai / Kellys Beach and the surrounding coastal area is identified as a Significant Ecological Area–Marine 2 (SEA-M2-42a) due to the variety of intertidal habitats present that provide a habitat for a wide variety of marine organisms.

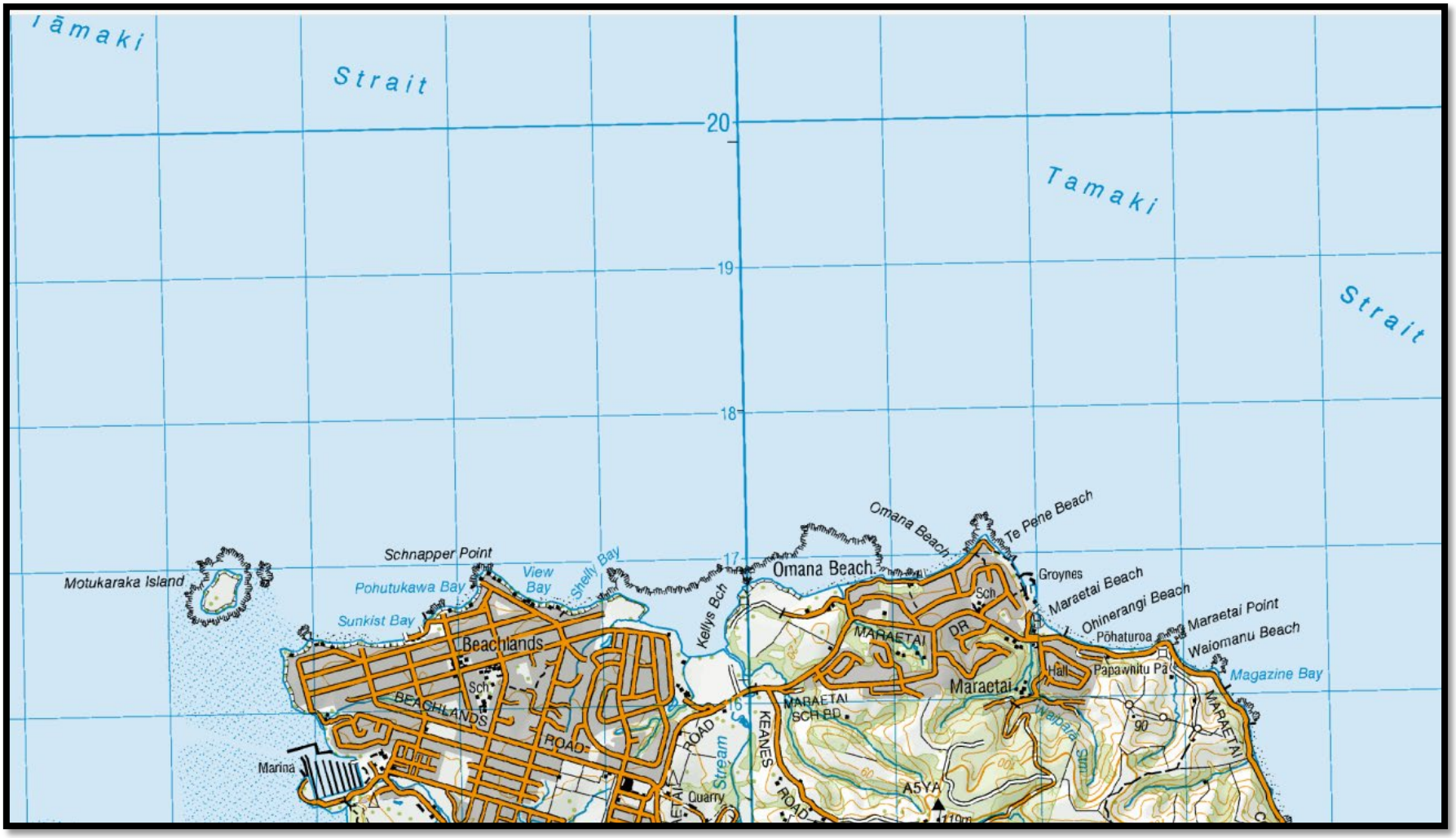


Figure 3-4 Topographical map showing Te Maraetai / Kellys Beach, the wider Beachlands and Maraetai coastal area and the Tamaki Strait offshore marine environment

(Source: NZTopo50 BA32 and BA33, Edition 1.07 Published in 2022.)

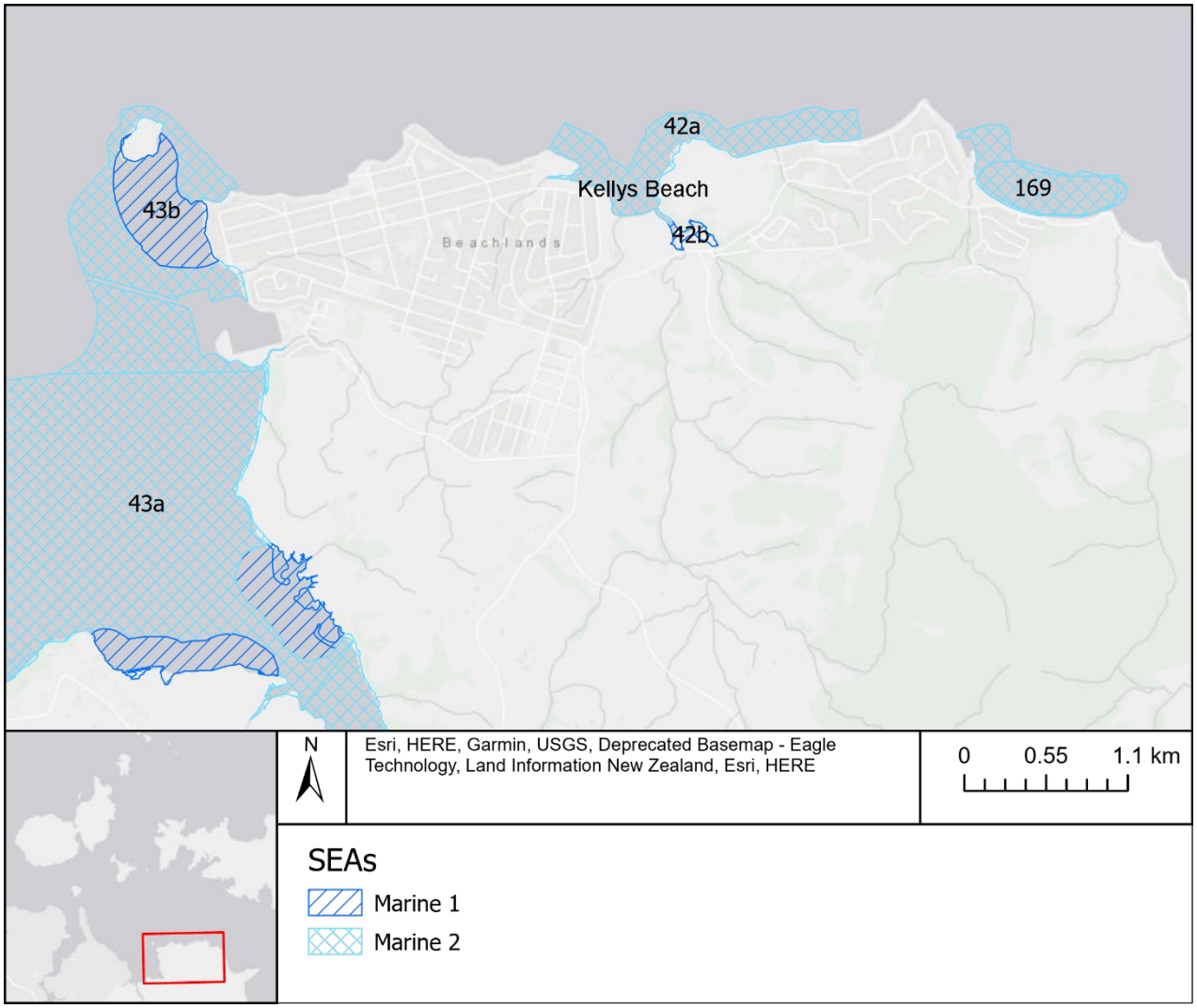


Figure 3-5: Auckland Unitary Plan 'Significant Ecological Areas – Marine' around Te Maraetai / Kellys Beach[17]

A survey of the intertidal area around Te Maraetai / Kellys Beach was conducted on 21st December 2023 around low tide to describe the intertidal marine community of the coastal receiving environment. The intertidal survey found that:

- Upper shore of Te Maraetai / Kellys Beach is very muddy with abundant crustacean burrows. Mangroves line the stream bank around the entrance to Te Puru Stream.
- Mid to lower shore is sandy with scattered shell/rock. Low lying shell banks are present in some areas.
- Juvenile cockles and pipi were present in low to high densities across the mid to lower sandflats, but no shellfish were found that were near harvestable size.
- Three small patches (each 2 m × 1 m) of moderately dense seagrass were observed near the low tide mark, which are much too small to meet the criteria of biogenic habitat.
- Intertidal sandstone reef platforms are present on either side of the bay that provide a habitat for a range of common intertidal species.
- Several coastal and seabirds were observed on the intertidal flats during the survey. These included New Zealand dotterels (Charadrius obscurus), variable oystercatchers (Haematopus unicolor), black-backed gulls (Larus

[17] Source: Stewart et al, 2024; pg 67

dominicus), and white-faced herons (Egretta novaehollandiae). A nesting area for New Zealand dotterels on the upper beach west of Te Puru Stream had been cordoned off.

In summary, the intertidal marine community at Te Maraetai / Kellys Beach is typical of sheltered beaches around the Auckland region. The only threatened marine species (excluding birds) observed during the survey was seagrass, which was present in three very small patches on the lower shore.

3.5.2 Coastal Area of Beachlands and Maraetai

To the west of Te Maraetai / Kellys Beach, Sunkist Bay grades from sand at the high tide mark to shell and bedrock on the lower intertidal area. Shellfish (cockles, pipis and wedge shells) abundances in this bay were low. Adjoining Sunkist Bay to the west, the area around Motukaraka Island is identified as a Significant Ecological Area-Marine 1 (see Figure 3-5) due to the presence of large shellbanks that are used as high tide roosts by wading and coastal birds. Extensive seagrass beds have developed over this area over the last decade. South and west, most of Whitford embayment, including the area around Motukaraka Island is identified as a Significant Ecological Area-Marine 2 due to the presence of large areas of intertidal flats that provide a habitat for a wide range of marine species. The intertidal flats also provide feeding and roosting areas for a variety of coastal and wading birds. The intertidal macrofaunal community is typical of sheltered northern estuaries.

To the east of Te Maraetai / Kellys Beach, Omana Beach is a sandy/shelly beach with no shellfish beds. Further east, Maraetai Beach is popular for recreation and is identified as a Significant Ecological Area-Marine 2 (see Figure 3-5) due to the long sandy beach that provides extensive feeding areas for wading and coasting birds.

Occasional blooms of the nuisance cyanobacteria Okeania spp. have been reported along the Beachlands-Maraetai coastline. In the late 1970s Okeania spp. were reported as seasonally dominant species around Motukaraka, and throughout the 2000's there were regular occurrences of the Okeania spp. blooms around the Beachlands and Omana area. No Okeania spp. blooms were observed in Te Maraetai / Kellys Beach during the intertidal survey. Little is known about the drivers and impacts of cyanobacterial blooms.

3.5.3 Off-shore Marine Environment – Tamaki Strait

Tidal currents directly offshore of the Beachlands-Maraetai coastline are moderate (<0.25 cm/s) and substrates are predominantly muddy sand, though large patches of shell hash occur in places.

An underwater video survey was conducted approximately 3km offshore of Te Maraetai / Kellys Beach in November 2023. The survey found that the habitat throughout the region was sandy-mud to muddy-sand interspersed with patches of dense shell. The Mediterranean fan worm, an unwanted organism, was the only common epifaunal species observed. Other species that were occasionally observed included sponges, hydroids, bryozoans, horse mussels, 11-armed starfish and sea cucumbers. No rocky reefs, living biogenic habitats, or regionally significant benthic species were observed in the survey.

4. Resource Consent Information

4.1 Current Resource Consents

Table 4-1 sets out the current resource consents that Watercare holds for the Beachlands Wastewater Scheme.

Table 4-1: Current Resource Consents

Consent # and Type	Purpose	Date Granted	Expiry Date
Discharge Permit (Treated Wastewater) Consent # 26875	To authorise the discharge of treated domestic wastewater into the Te Puru Stream via ground soakage in accordance with Section 15 (1 a) of the Resource Management Act 1991	3 August 2005	31 December 2025
Discharge Permit (Air) Consent # 26876	To authorise the discharge of contaminants to air associated with the operation of a wastewater treatment plant in accordance with Section 15 (I)(c) of the Resource Management Act 1991	17 July 2006	31 December 2026
Discharge Permit (Stormwater) Consent # 33614	To authorise the diversion and discharge of stormwater from 0. 29ha of new impervious surface to be created as part of a wastewater treatment plant upgrade in accordance with Sections 14(1)(a) and 15(1)(a) and (b) of the Resource Management Act 1991	23 March 2007	31 December 2041

4.2 Activities Subject to this Application

Watercare is seeking to replace its existing treated wastewater discharge consent (Consent # 26875) with a new consent containing different discharge limits and a higher maximum discharge volume.

The activity for which consent is sought is the discharge of treated wastewater from the WWTP, via an overland flow system, to a tributary of the Te Puru Stream, and to groundwater.

The proposed discharge volumes are set out in Section 7.

The proposed discharge is classified as a discretionary activity under the AUP. The applicable AUP rule that applies, the type of consent required, and the activity classification are set out in the table below.

Watercare request that the application be publicly notified.

Table 4-2: Unitary Plan Rule and Activity Classification

Rule	Description	Classification
E6.4. Activity table (A6)	Discharge of treated or untreated wastewater onto or into land and/or into water from a wastewater treatment plant.	Discretionary Activity

4.3 Consent Term

A term of 35 years is sought for the consent. A term of 35 years is considered appropriate because:

- Effective wastewater collection, treatment and discharge facilities are and will continue to be essential for community health and wellbeing.
- Watercare has investigated and assessed a comprehensive range of possible alternatives.
- Watercare has a substantial existing investment in the current wastewater scheme. This will become even more substantial once the upgrades to the WWTP are undertaken and the new WWTP commissioned.
- Watercare has considered population growth and servicing requirements over a 35 year term and proposes a staged approach to the discharge to reflect increases in demand for wastewater services over the term of the consent, and improvements in discharge quality through the New WWTP (MBR) Long-term Stage 1 and 2.
- The quality of the treated wastewater discharged to the overland flow system and ultimately to the Te Puru Stream will be high once the new WWTP (MBR) Long-term Stage 1 is commissioned. This quality, particularly with the membranes and the UV treatment, will be one of the highest in New Zealand for municipal WWTPs.
- The proposed wastewater treatment process is well proven both in New Zealand and internationally.
- The effects of the proposed wastewater discharge can be appropriately mitigated.
- Watercare is proposing an appropriate technology review condition in the consent.

4.4 Activities not covered by this Application

Without the certainty of the discharge consent, Watercare is unable to further the design of the new WWTP and the extended overland flow system. Should this application be granted, Watercare will then be able to confirm the following resource consents details:

- Land use consent (regional) for earthworks associated with the construction of the upgraded and new wastewater treatment plant and extended overland flow system including earthworks in an SEA.
- Land use consent required under the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health.
- Any consents required under the National Environmental Standard for Freshwater.
- Vegetation alteration or removal within a SEA and riparian areas.

As set out in Table 4-1, the existing air discharge consent (permit # 26876) has a later expiry date than the wastewater discharge consent. Watercare intends to lodge the air discharge consent application in accordance with the timeframes set under s124 of the RMA, should this application for consent be granted.

Once the detailed design of the extension to the overland flow system is available, and if parts of the system are to be located outside the current designation Watercare will determine whether it wishes to seek an alteration to the boundary of the designation.

5. Cultural Considerations

Watercare is continuing to work with Ngāi Tai ki Tāmaki to understand the effects of the treated wastewater discharge to their ancestral landscape, Te Taiao, and is committed to supporting Ngāi Tai ki Tāmaki as partners in the process following the lodgement of the application.

Take Taiaomaurikura is an Iwi planning document of Ngāi Tai ki Tāmaki. The vision, principles and kaupapa contained in Take Taiaomaurikura, outline what is important to Ngāi Tai and will guide the decisions they make when responding to plans and applications that affect their rohe. Take Taiaomaurikura states that Auckland Council, and other parties such as consent applicants should give effect to the vision, principles and kaupapa in Take Taiaomaurikura at the earliest possible opportunity.

The vision, principles and values provide a framework for assessing the effects of the proposal on Te Taiao and the Ngāi Tai ki Tāmaki connection to Te Taiao.

As stated in the Stakeholder Engagement Report, Ngāi Tai ki Tāmaki requested Watercare to record that Ngāi Tai ki Tāmaki are the iwi taketake (original inhabitants) of the area and Ngāi Tai ki Tāmaki do not recognise or accept any other iwi or hapū Cultural Impact Assessments / Cultural Values Assessments or registration of interest that may be submitted on this kaupapa.

Acknowledging that Ngāi Tai ki Tāmaki has stated their intention to provide a cultural statement which will be progressed following lodgement of this application, the key themes communicated by Ngāi Tai ki Tāmaki in its engagement with Watercare on proposed discharge options to date include:

- The cultural significance for Ngāi Tai ki Tāmaki of Te Puru Stream, the surrounding whenua and wider cultural landscape and Te Marae-o-Tai / Tāmaki Strait and Tikapa Moana / Hauraki Gulf
- The historical grievance caused by the lack of engagement with Ngāi Tai ki Tāmaki on the original decision to place the discharge from the WWTP into the tributary of Te Puru Stream and Te Ruangaengae / Ruangaingai Stream (pumpstation location)
- Ngāi Tai ki Tāmaki has a preference for land based discharges of treated wastewater
- Opposition to conveyance of wastewater out of the Beachlands service area for treatment and discharge in the rohe of another iwi
- Opposition to a marine discharge and construction of any new structures within the coastal marine area of the Tikapa Moana / Hauraki Gulf
- Opposition to a direct discharge to Te Puru Stream and other waterways within the Ngāi Tai ki Tāmaki rohe.

Subject to further investigation and support of the opportunities identified for co-design of the overland flow system and provision of water supply for a proposed nursery, Ngāi Tai ki Tāmaki provided a generally supportive response to the technical preferred option involving diffuse discharge (via overland flow system) to a tributary of Te Puru Stream.

Watercare has taken into account this feedback in selecting the BPO for the discharge application.

The ongoing outcomes of the continued engagement between Ngāi Tai ki Tāmaki and Watercare will be documented and, with the agreement of Ngāi Tai ki Tāmaki, will be provided to the consent authority.

6. Positive Effects

In accordance with the definition of 'effect' in s3(a), and s104(1)(a) of the RMA, positive effects of the proposal need to be assessed. Positive effects should be kept to the fore when weighing all effects as defined under the RMA and considering the proposal in terms of the purpose of the RMA.

The positive effects of the proposal include:

Public health: The proposal to discharge treated wastewater from the WWTP will form an integral part of the Beachlands Maraetai wastewater scheme that provides a safe and reliable public health sanitation system for the community. Currently, wastewater services cannot be provided to the Beachlands-Maraetai community without some form of discharge of the treated wastewater. Sanitation of wastewater is crucial to the well-being of people in these communities. Conveying untreated wastewater away from residential and commercial areas to treat the water enables domestic and commercial activities to occur while protecting public health.

Enabling growth: As set out in previous sections, the current WWTP is at capacity and nearing the end of its economic life. The proposal will enable future development with appropriate and affordable municipal wastewater services. Operational efficiency is crucial for infrastructure outcomes. Sanitation can become unaffordable for homeowners if the operational budget is not managed carefully.

The proposal provides Watercare with the ability to successfully service the Beachlands South area subject to PPC88 and the proposed business park for light industrial and business uses adjacent to a former quarry site which is subject to a fast-track resource consent process. The granting of this consent will mean that the developers of Beachlands South and the business park will not have to provide on-sites facilities for the treatment and discharge of wastewater and that the management of the community's wastewater can be centralised at the WWTP.

Social and economic: The proposal will have positive social and economic effects, by providing the community with economically sustainable and affordable wastewater treatment system.

Consolidating wastewater discharges: Watercare is working with the applicants of PPC88 and for the proposed business park to enable the wastewater generated by these proposed developments to be reticulated to the WWTP for treatment and discharge. The applicants' original proposals provided for individual wastewater treatment and discharge solutions. The centralisation of the area's wastewater treatment and discharge at the WWTP will result in only one discharge to the environment rather than three separate discharges. It will also ensure the consistent and effective management of the community's wastewater by a highly competent and experienced operator.

Ecological enhancement: The expansion of the overland flow system and improvements to the current system provide the opportunity to increase the extent of indigenous flora on the WWTP site. This coupled with the proposed riparian planting and improvement in the wastewater discharge quality should result in the overall enhancement of ecological values at the WWTP site.

7. Effects of the Discharge to Land (Overland Flow Area)

This section identifies the potential adverse effects that may arise from the discharge of the treated wastewater to the existing and future overland flow areas. The assessment is a summary of the PDP memo 'Assessment of Potential Effects on Soils and Ecology from Beachlands WWTP Overland Flow System (Memorandum 4)'.

PDP has identified that the discharge of the treated wastewater to the existing and future overland flow areas has the potential to cause adverse effects in relation to:

- Terrestrial ecological values, and
- Groundwater quality.

7.1 Terrestrial Ecology

As identified in section 3.3, the WWTP site includes SEA_T_428 (see Figure 3-2). Within this SEA, PDP has identified the presence of possible wetlands in the gullies and riparian margins adjoining the proposed overland flow expansion area (B2) and downstream of the farm pond. Potential adverse effects on these areas will be managed by locating the future expansion to the overland flow area outside of these ecologically valuable areas and by designing the proposed overland flow area so that it drains to the farm pond. With respect to the ecological values of the existing overland flow area and farm pond, PDP has concluded that these specific areas are not natural ecosystems and do not meet the SEA or natural wetland criteria.

Given that:

- The future overland flow area will not drain to the ecologically valuable areas, and
- The existing overland flow area and farm pond have low ecological values.

It is considered unlikely that the discharge of treated wastewater to overland flow areas will have adverse effects on the terrestrial ecological values of the WWTP site.

Further, it is noted that there is potential for positive terrestrial ecological effects if, subject to final design, the overland flow areas are planted with native flora.

7.2 Groundwater

The soils within the WWTP site are deep with low hydraulic conductivity and high adsorptive capacity. As a result, the downward migration of contaminants from the application of treated wastewater to the overland flow areas is expected to be limited. In addition, the recharge area that feeds the groundwater flowing beneath the overland flow areas is estimated to be 4 to 6 times larger than the area of the overland flow area itself. Consequently, any contaminants that do infiltrate through the soils will be mixed with this larger upgradient flow. Any potential groundwater effect will occur over a short distance (no more than hundreds of metres) to the nearest stream discharge zone. Finally, compared to the discharge to the Stream, the influence of infiltration via groundwater on Te Puru Stream is expected to be undetectable. For these reasons it is considered that potential effects on groundwater arising from the application of treated wastewater to the overland flow areas will be very low.

7.3 Overland Flow Management

Watercare's proposal is to manage any potential adverse effects through good practice design and operational measures. These measures will involve:

- The review of the design and operation of the existing overland flow area and pond to ensure that it aligns with good practice and seek to replicate the existing overland flow system over the new area.
- Ensuring the final location, design and operational recommendations for the proposed additional overland flow system address any potential erosion and land stability effects.

- Provision of planting of suitable species within the overland flow area which are fit for purpose and, to the extent practicable, contiguous with the species found in the SEA area.

Further details on these measures are set out in Section 10. Based on these measures it is considered that any adverse effects arising from the proposed discharge to the overland flow area will be very low.

8. Effects of the WWTP Discharge on Te Puru Stream

The section assesses the effects of the WWTP on Te Puru Stream, including the tributary of Te Puru Stream into which the WWTP discharges. It considers potential hydrological impacts, potential effects on the water quality of the stream and potential effects on stream ecology.

8.1 Hydrology

Two technical reports have been prepared to assess the potential effects of the WWTP discharge on stream hydrology. These are:

- Stream Hydraulic Assessment, March 2024, prepared by PDP
- Discharge Volume Increase Assessment on Stream Habitat, April 2024, prepared by Bioresearches

These reports identify that the potential hydrological effects on Te Puru stream from the WWTP discharge relate to:

1. Physical effects, particularly erosion of stream channels.
2. Reduction in native fish habitat arising from increased flow velocities.

8.1.1 Physical Effects

PDP's Stream Hydraulic Analysis uses modelling to identify the extent to which the current and future WWTP discharge will influence stream flow under a variety of flow conditions. The results of this modelling[18] indicate that:

- At the 90th %ile flow, the current WWTP discharge accounts for approximately between 30 and 70% of flow of the tributary of Te Puru Stream between the farm pond and bridge, whereas future WWTP discharge volumes that will occur under Long-term Stage 2 of the consent would account for approximately between 58% and 88% of the 90th%ile stream flow.
- During flood events (2-yr, 5-yr and 10-yr Average Recurrence Intervals) under both current and future scenarios, the WWTP discharge would account for only a minor portion of total stream flow of the tributary of Te Puru Stream (at most approximately 7% of the flow between the farm pond and bridge).

In addition, PDP has assessed the effect of the current and future WWTP discharges on stream flow velocities of the tributary of Te Puru Stream. The assessment indicates that the discharges have a minimal influence on velocities at the 90th %ile flow and have no influence on velocities during higher flow events.

As part its assessment, PDP also undertook site visits to assess current stream bank and bed erosion. They noted that there is currently evidence of stream bank erosion between the farm pond and bridge site, and near the confluence with Te Puru Stream, but minimal erosion at the Quarry site. PDP concluded that this erosion was likely caused by storm events and is restricted to localised areas where weak material is being undercut.

As the current and future WWTP discharges will only have a minor influence on stream flow and velocities during storm events, PDP has concluded that the effect of the proposed WWTP discharge on stream bank erosion will be no more than minor.

It is noted that Bioresearches has recommended that '*infill riparian planting with deep rooting vegetation is undertaken within these more vulnerable meandering reaches'*[19]. Even though the effects of the WWTP discharge on stream bank erosion are anticipated to be no more than minor, Watercare is proposing to adopt Bioresearches recommendation and undertake riparian planting within the Watercare site boundary as this is the reach which they can undertake works within. See section 10.7 for further information.

PDP also identified capacity issues and potential erosion risks associated with the culvert at the downstream end of the farm pond (see Figure 8-1 for location of this culvert). In the event that they are required, Watercare proposes to address

[18] See Table 2 of the PDP Stream Hydraulic Assessment
[19] See pg 5 of Discharge Volume Increase Assessment on Stream Habitat, April 2024, prepared by Bioresearchers

the capacity and erosion issues as part of the Overland Flow Design and Operation Management Plan described in Section 10.5.

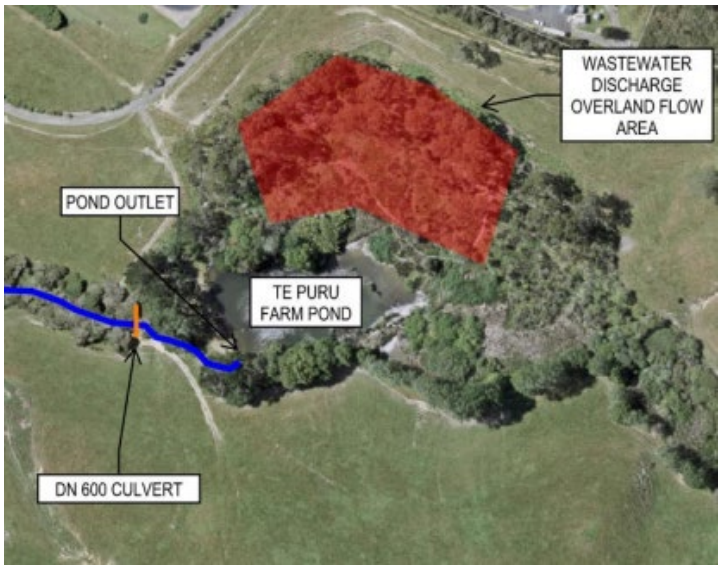


Figure 8-1: Location of Farm Pond culvert

8.1.2 Hydrological Impacts on Fish Habitat

An assessment by Bioresearches has evaluated the potential hydrological impact of the current and future WWTP discharges on fish habitat. An increase in discharge volumes may result in increases in depth and stream velocity, which in turn may result in a decrease in suitable fish habitat preferences. For the purposes of this assessment, Bullies were selected as the exemplar species as they have the lowest velocity threshold of the fish species present in the study area. For Bullies stream velocities over 0.5 ms-1 correlate to a decrease in suitable habitat.

Currently, the fastest flowing site within the tributary of Te Puru Stream was Site G (see Figure 3-3 above), with an average flow velocity of 0.066 ms-1. This indicates that the current WWTP discharge does not cause hydrological impacts on fish habitat within the stream.

Under the proposed discharge for Long-term Stage 2 of the consent (i.e. the maximum discharge scenario), Site G is estimated to have an increase in flow velocities to approximately 0.133 ms-1. This remains well below the 0.5 ms-1 threshold for adverse effects on bully habitat. Therefore, it is considered that the stream velocities arising from the proposed WWTP discharge, even under the maximum discharge volume scenario, are unlikely to result in a reduction of native fish habitat.

8.2 Freshwater Water Quality

An assessment of the potential impact on water quality in Te Puru Stream is provided in Streamlined Environmental's Water Quality, Ecological and Human Health Effects Assessment[20]. The following section summarises the findings of that assessment.

It is noted that the assessment in Streamlined Environmental's report, and summarised below, is based on the proposed operational limits for each stage of the WWTP discharge. Streamlined Environmental notes that this is a conservative approach as actual concentrations in the WWTP discharge are expected to be less than the operational limits.

8.2.1 Physical Stressors

The physical stressors on water quality that have been assessed are DO and $cBOD_5$, water temperature, pH, conductivity and salinity, and TSS and turbidity.

[20] Stewart, M., James, M., and Sim-Smith, C. (2024) Beachlands Wastewater Treatment Plant – water quality, ecological and human health effects assessment. Report WSL2303–D1, Streamlined Environmental

DO is critical to supporting healthy aquatic ecosystems. High BOD in the WWTP discharge has the potential to result in low DO concentrations in the tributary and Te Puru Stream as oxygen is consumed during organic matter decomposition.

Monitoring at receiving environment sites indicates that the occasional low DO in the existing WWTP discharge is not currently impacting DO in the pond or further downstream. The WWTP discharge is expected to continue to have a negligible effect on DO levels in the pond or further downstream following the proposed Long-term upgrades. As a result, no DO standards are proposed for the future discharges.

Monitoring of treated wastewater quality has identified recent elevated $cBOD_5$ in the discharge. However, receiving environment monitoring indicates that these elevated levels are not impacting $cBOD_5$ in the farm pond or further downstream. All receiving environment sites are well below relevant guidelines values indicating negligible effect from the discharge on this element of water quality.

Following the proposed Long-term upgrades, the improved treatment process will reduce $cBOD_5$ by approximately 1.4-fold. While there will also be an approximate 3-fold increase in discharge volume by Long-Term Stage 2, the treatment improvements that will be delivered mean that it is expected that the potential adverse effects of the proposed discharge on $cBOD_5$ will remain negligible, and further the reduction of $cBOD_5$ will contribute to an overall improvement in water quality downstream of the discharge compared with the existing situation.

Data on water temperature is available for monitoring site A and site B (see Figure 3-3) for the monitoring locations). This data indicates that stream water temperature above and below the WWTP discharge location is currently well above Auckland Council guidelines[21]. This suggests that even without the WWTP, water temperatures in the stream have the potential to cause stress on aquatic life. Recent monitoring indicates that the current WWTP discharge is having a minimal additional impact on water temperature in the farm pond. While there are no water temperature standards for the Long-term upgrades, it is considered that future discharge will have only a low impact on downstream water temperatures.

With respect to the potential impact of the WWTP discharge on pH levels, low pH appears to be more of an issue than high pH in the receiving environment. Further, it is considered that the current WWTP discharge is having negligible impacts on pH at sites downstream and that treated wastewater discharges following the Long-term upgrades will continue to have negligible effects on pH.

With respect to conductivity, all Te Puru Stream sites monitored between September 2023 and January 2024 had 80th percentile concentrations above the ANZG 80th percentile DGV (155 µS/cm), indicating a 'potential risk' of adverse effects. Sites upstream of the WWTP discharge only marginally exceeded this DGV, whereas monitoring results indicate that the WWTP discharge is having a clear additional influence on conductivity downstream.

Despite the influence on conductivity exerted by the WWTP discharge, it is noted that the NIWA Stream Health Monitoring and Assessment Kit (SHMAK) report suggests that direct effects from conductivity on stream life do not occur until conductivity reaches levels found in brackish water or seawater, well above the conductivity identified within Te Puru Stream sites. Further, while elevated conductivity may lead to reduced DO, there are no apparent effects on DO downstream attributable to the current WWTP discharge.

These factors indicate that the discharge currently has, and will continue to have, a negative influence on conductivity in the tributary and Te Puru Stream, with the potential to contribute to low / moderate adverse environmental effects. Given this potential adverse effect, Watercare has accepted Streamlined Environmental's[22] recommendation to propose a trigger for conductivity, which if exceeded during the consent term will result in investigations and potentially remedial action being undertaken (see section 10.3 for further discussion about this proposed mitigation measure). It is considered that this approach will ensure that actual adverse effects remain low.

TSS levels can have an impact on receiving environments by directly affecting physiological processes of invertebrates and fish and availability of light for photosynthesizing plants (algae, periphyton, macrophytes). There can also be impacts on aesthetics and recreation through changes in water clarity and colour. The current WWTP discharge has consistently low TSS and there appears to be little difference in TSS for the receiving environment sites upstream and downstream of the WWTP discharge. The improved treatment performance that will occur following the Long-term upgrades will result in an approximate 1.4-fold decrease in TSS from the WWTP discharge. As a result, the TSS in proposed discharge will have

[21] See section 5.3.1 of Stewart et al for details on these guidelines.
[22] Stewart et al, 2024, pg 99

a negligible effect on the tributary and Te Puru Stream and further the Long-term upgrades will contribute to improved water quality downstream of the discharge compared with the current situation.

8.2.2 Nutrients

Nutrients in discharges from WWTPs have the potential to cause significant environmental impacts on freshwater environments. This assessment considers potential toxicity effects that may arise due to ammoniacal-N and nitrate-N in the discharge, and potential eutrophication effects which may arise from DIN and DRP in the discharge.

Ammoniacal-N makes up only around 0.5% of TN being discharged from the WWTP. The current WWTP discharge is therefore unlikely to be significantly contributing to ammoniacal-N concentrations downstream. Future concentrations are not expected to increase significantly from current and will be very low in the discharge, and not contributing significantly to elevated nitrogen downstream. It is noted that processes in the pond, into which the WWTP discharges via the overland flow area, will continue to increase ammoniacal-N levels downstream. Despite these processes within the pond, levels would be expected to meet the NBL for ammoniacal-N toxicity and be unlikely to impact on species found downstream.

During the Current and Short-term stages median nitrate-N concentrations (3.5 mg/L) in the WWTP discharge are expected to result in an increase in instream nitrate-N concentrations downstream of the discharge point (1.1 mg/L at site 15 (downstream) compared with 0.02 mg/L at upstream site A). This effect equates to a shift from NPS-FM attribute band A to band B for toxicity. Based on narrative band descriptions in the NPS-FM, this indicates that the level of adverse toxicity effect from nitrate-N during these initial stages of the consent will be low.

The Long-term WWTP upgrades will result in a significant reduction in median nitrate-N concentrations in the discharge. This improvement will in turn likely result in a significant reduction in instream nitrate-N concentrations at the potential mixing zone (site 15), corresponding to an improvement in the NPS-FM attribute band from B (under the Current and Short term stages) to A (under Long-term stages) for toxicity. In other words, while the discharge will result in median instream concentrations of nitrate-N increasing downstream relative to concentrations at site A upstream, the downstream concentrations will remain within attribute band A. Based on narrative band descriptions in the NPS-FM, this indicates that any potential toxicity effects from nitrate-N in the discharge during Long-term stages will be negligible.

For DIN, the discharges during the Current and Short-term consent stages will contain a median concentration of 4.1 mg/L. This is expected to result in a DIN concentration at site 15 of 1.3mg/L. This represents an improvement relative to the existing discharge but will marginally exceed the threshold (1 mg/L) for eutrophication. Following the Long-term upgrades median DIN in the discharge will not exceed 2.5 mg/L which is anticipated to result in a DIN concentration at site 15 of around 0.8 mg/L. This is below the accepted threshold for eutrophication.

The median concentration of DRP in the WWTP discharge during the Current and Short-term consent stages of the consent will be 1.0 mg/L. This is expected to result in in-stream concentrations at site 15 being 0.251 mg/L. Following the Long-term upgrades, the median concentration of the DRP in the discharge will not exceed 0.5 mg/L. This is expected to result in in-stream concentrations at site 15 being 0.125 mg/L, which represents an improvement relative to current levels.

Under both the short and long term upgrades the concentration of DRP in the WWTP discharge will result in instream DRP concentrations being within NPS FM band D. It is expected that these elevated DRP concentrations may, in combination with other factors, result in moderate adverse effects on the Stream ecology (see section 8.3 for further discussion on this point).

8.2.3 Metals

Monitoring indicates that current metal concentrations are currently at 50% or below the ANZG DGV at the Bridge site. Zinc, copper and chromium appear to be increasing at the farm pond site (and to a lesser extent at site 15) to near ecological guideline values as a result of the influence of Beachlands WWTP discharge. Monitoring results also show that all sediment metal concentrations were below the ANZG DGV, with only zinc reported at concentrations that were increased downstream of the influence of Beachlands WWTP relative to upstream. These results indicate that the current discharge is having a minimal adverse effect on downstream metal concentrations.

No discharge standards are proposed for metals for the Long-term WWTP upgrades. Concentrations of metals in the discharge are not expected to increase, however with a 3-fold increase in discharge volume proposed, loads will increase proportionally. To mitigate any potential risk from metals in the future discharge, it is proposed to monitor metals, to ensure metals are not increasing to above DGVs downstream as a result of the WWTP (see section 10.8 for further discussion). Based on this proposed mitigation measure it is considered that potential adverse effects from metals will be less than minor.

8.2.4 Emerging Organic Contaminants

To estimate the ecological risk presented by the EOCs in the WWTP discharge, hazard risk quotients (**RQs**) were calculated. The RQ was calculated as EOC concentration/ predicted no-effect concentration (**PNEC**), with a value >1 indicating a potential ecological effect.

Based on this assessment, it is considered that the majority of EOCs will have negligible ecological effects based on measured and literature treated WWTP discharge concentrations. Most of the limited number of EOCs that are present in concentrations above ecological effects concentrations will likely be significantly attenuated and/or diluted in the freshwater environments and present a low risk of adverse effects. Overall, the effects on the environment from EOCs present in the proposed discharge during all stages covered by this consent application are likely to be between negligible and low.

Notwithstanding this conclusion, Watercare is proposing to undertake monitoring, through consent conditions to better understand the risks of EOCs from the discharge (see Section 10.8).

8.2.5 Microbiological Effects

The potential effects from the WWTP on the microbiological quality of Te Puru Stream, and therefore public health risks, have been assessed:

1. By considering indicator bacteria results.
2. Through a Quantitative Microbial Risk Assessment (QMRA) and comparison of the QMRA results with the anticipated treatment effectiveness of the WWTP during the proposed staged upgrades.

With respect to indicator bacteria, it is noted that E. coli, FC, and enterococci are at extremely low concentrations (median 2 cfu/100 mL for all three) in the WWTP discharge. For the receiving environment sites, bacteria concentrations are highly variable and higher upstream of the WWTP discharge. This suggests that catchment sources dominate FC and E. coli concentrations, which will be uninfluenced by proposed staged upgrade of the WWTP. Therefore, it is considered that risks from pathogens (as indicator bacteria) discharged by the WWTP are negligible compared to catchment sources and will remain so with the upgrades proposed in this application.

The QMRA identifies the level of treatment (log reduction) that needs to be achieved by the WWTP during the proposed upgrade stages in order to ensure that mean infection risks arising from the discharge are within acceptable limits for users of the Stream. It is noted that the QMRA looks at the added risk from the WWTP discharge, there is still existing risks from other sources, but these are not part of QMRA.

In summary, the required levels of effectiveness identified in the QMRA are:

- For watercress consumption, a Norovirus[23] log reduction of 5 is required to reduce the risk of infection to <1% at the Te Puru stream sites.
- For swimming, a Norovirus log reduction of 4 is required to reduce risks to below 1% at Te Puru stream sites, while it was noted that swimming is unlikely at these sites.

Log reductions for Norovirus that are anticipated to be achieved by the WWTP during each of the proposed stages are set out in Table 8-1. This shows that the required level of effectiveness will be met or exceeded in all of the proposed stages. Therefore, it is considered that the potential effects of the WWTP on microbiological water quality and public health risks in Te Puru Stream will be low.

[23] Norovirus is the exemplar virus used for the purposes of the QMRA

Table 8-1: Log reductions in Norovirus at each of the proposed consent stages

Stage	Existing WWTP			New WWTP
	Current	Short-Term Upgrade	Long-Term Upgrade Stage 1	Long-Term Upgrade Stage 2
Secondary / tertiary treatment	2.0	2.0	4.5	4.5
UV disinfection	3.0	3.0	3.0	3.0
Total	**5.0**	**5.0**	**7.5**	**7.5**

8.3 Aquatic Ecology

The effects on aquatic ecology that have been identified as arising from the existing WWTP discharge are indicative of the potential effects that may arise during the proposed 'current' and short-term consent stages. The effects include:

- Localised decreases in the presence of native fish and pollutant sensitive macroinvertebrates, which correspond with the decreases in water quality parameters, e.g. conductivity and nutrients, downstream of the WWTP discharge.
- Nuisance aquatic plant growth which coincides with increased conductivity and bioavailable nutrient concentrations (DIN and DRP) below WWTP discharge point. It is noted that these adverse effects could in part be caused by a lack of shading at downstream sites and the ongoing observed level of stock access to streams.

While some decreases in water quality parameters are predominantly limited to a short length of stream of at least 200 m downstream of the farm pond (Site F), conductivity and nutrients are affected for a greater distance. Further, macroinvertebrates, native fish communities, and filamentous algae do not appear to fully recover at the most downstream sites, which often lacked more sensitive taxa.

Overall, the aquatic ecology downstream of the existing WWTP discharge is 'degraded' compared with the existing environment and these adverse effects are expected to continue during the proposed 'Current' and Short-term consent stages.

The proposed long-term MBR WWTP will result in an improvement in water quality compared to the current water quality results and is highly likely to result in an improvement in the overall macroinvertebrate and fish community downstream compared to the most recent survey results. Other measures, such as the proposed conductivity trigger, the riparian planting and the monitoring of metals will also mitigate potential adverse effects. Overall the WWTP discharge is expected to contribute to moderate adverse effects on the Stream ecology in combination with others conditions and stressors in the catchment, such as the soft substrate, limited riparian vegetation and the influence of other land uses.

9. Effects on the Coastal Marine Area

The assessment of effects from the WWTP discharge on the CMA focusses on the potential impact of salinity, nutrients and microbiological risks to human health and recreation activities. The following sections summarise assessments included in Streamlined Environmental's Water Quality, Ecological and Human Health Effects Assessment [24].

9.1 Salinity

The proposed discharge, under all consent stages, will have negligible effects on the salinity and the marine communities of Te Maraetai / Kellys Beach. This conclusion is based on the relatively low discharge rates from the WWTP compared to other nearby streams and rivers, the rapid dilution that occurs within the stream and CMA, and the tolerance of intertidal biota to low salinities.

9.2 Effects from Nutrients

Nitrogen, and to a lesser extent, phosphorus, are the two primary limiting nutrients of concern in coastal waters. Small increases in these nutrients can lead to increased productivity, but excessive concentrations can result in nuisance phytoplankton and macroalgal booms, increased turbidity, and reduced dissolved oxygen near the seabed.

With the Long-term upgrades, median nutrient concentrations in treated wastewater that is discharged from the WWTP are proposed as follows:

- 5 mg/L TN
- 0.5 mg/L for TP
- 0.5 mg/L DRP

Stream monitoring indicates that concentrations of nitrogen (TN and nitrate-N) and phosphorus (TP and DRP) materially decrease in concentration down Te Puru Stream with the increasing distance from the WWTP due to dilution[25]. Concentrations of these nutrients will be diluted 309× (50%ile) by the time they reach the Te Puru Stream mouth, making them well below background concentrations as they enter coastal waters. Modelling by DHI[26] shows that concentrations will be further decreased by mixing with coastal waters.

Based on this level of dilution, nutrient concentrations will be below background levels of coastal waters before the influence of the WWTP discharge reaches Te Puru Stream mouth. Given the rapid dilution rate, and the reduction of nutrient concentrations in the proposed discharge, no increase in nutrient concentrations in coastal waters, or related adverse effects from increased nutrients, are likely to occur as a result of the proposed discharge. Other minor contaminants that are present in the treated wastewater at low concentrations will be diluted at a similar rate to TN and TP. Mean annual attenuated TN and TP loads from the current WWTP are estimated to be 1,799 kg/year and 212 kg/year, respectively. Following the Long-term upgrades, mean annual attenuated TN loads are estimated to increase by around 114% to 3,856 kg/year, and mean annual attenuated TP loads are estimated to increase by around 200% to 637 kg/year (DHI, 2024). While these increases in loads represent a large percentage increase, the absolute values need to be considered in context with other nutrient inputs into the inner Hauraki Gulf and Firth of Thames. TN loads for the Tamaki River, Wairoa River, Piako River, and Waihou River are around 60,000, 160,000, 1,415,000 and 2,168,000 kg/year, respectively, while TP loads for the Piako River, and Waihou River are 74,000 and 121,000 kg/year, respectively. Given that the estimated loads from the upgraded WWTP represent a very small percentage of the TN and TP loads entering the inner Hauraki Gulf and Firth of Thames, the effects of the increased loads from the upgraded WWTP are assessed to be negligible.

[24] Stewart et al, 2024

[25] See Section 4.4.1.2of Stewart et al, 2024

[26] Assessment of Proposed Te Puru Stream Discharge, March 2024, DHI

9.3 Potential ecological effects in the coastal environment

Potential effects on SEA-M1-42b Te Puru Stream estuary and SEA-M2-42a are anticipated to be low given the level of influence the treated wastewater discharge will have on nutrient concentrations and salinity in coastal waters. There will be no change from the current WWTP scenario.

9.4 Microbiological, Public Health and Recreation Effects

As for Te Puru Stream, a QMRA has been used to assess the potential microbiological, public health and recreation effects of the WWTP on coastal waters. The QMRA identifies the level of treatment (log reduction) that needs to be achieved by the WWTP during all of the proposed consent stages in order to ensure that mean infection risks arising from the discharge are within acceptable limits for users. For coastal water users the required reductions identified by the QMRA are:

- For shellfish consumption, a log reduction of 1 is sufficient to provide a risk of <1% for the current discharge scenario at all marine sites. The required log reduction increases (due to increased wastewater volumes) but is below 2 for the proposed Short-term and Long-term (new MBR WWTP) discharge scenarios.
- For swimming, required log reductions range from 2-3 at Te Maraetai / Kellys Beach transect sites (depending on the proposed consent phase), but less than 1 for those further out in the bay and for all 3 consent phases.

As identified in Table 8-1, the anticipated log reductions proposed consent the Current and Short-term stages of the consent are 5, while in the Long-term Stages 1 and 2 over 7 log reduction is expected. As a result, the potential microbiological effects and public health risk arising from the WWTP on coastal waters are considered to be very low. As these effects would be the key cause of any potential recreation effects, it is considered that potential adverse effects on recreation activities in the marine environment are also very low.

10. Management and Mitigation Framework

This section outlines proposed consent compliance mechanisms, the monitoring programme intended to support compliance with the consent, and outlines proposals for management plans that may be incorporated into consent conditions.

10.1 WWTP Stages

Watercare proposes to monitor and model population growth within the WWTP catchment and to annually report on this to Auckland Council as part of the Annual Report. Once Watercare's monitoring and modelling of average daily flows indicates that population within the WWTP catchment will exceed 18,000 PE within six years, it will initiate design and construction of the Long-term upgrade.

The staging of WWTP activities is summarised in the table below.

Table 10-1: Staging of WWTP activities

Stage	Maximum Discharge Volume	Trigger to Commence Design Work for Stage
Current WWTP	4,500 m^3/d	n/a
Short-Term Upgrade	8,700 m^3/d	Design work is currently underway.
Long-term Upgrade Stage 1	28,900 m^3/d	Six years before population is projected to reach 18,000 PE (based on average daily flow).
Long-term Upgrade Stage 2	36,200 m^3/d	Four years before population is projected to reach 24,000 PE (based on average daily flow).

10.2 Discharge Volume

Consent is sought for the discharge volumes presented in Table 10-2.

Table 10-2: Beachlands WWTP Maximum Treated Wastewater Discharge Volumes

Parameter	Units	Existing WWTP		New WWTP	
		Current	Short-Term Upgrade	Long-term Stage 1	Long-term Stage 2
Maximum treated wastewater discharge	m^3/day	4,500	8,700	28,900	36,200
Average daily flow	m^3/day	2,800	3,600	4,800	6,000

A flow meter will be provided to measure the treated wastewater discharge volume on a daily basis.

10.3 Treated Wastewater Discharge Quality

Treated wastewater quality limits for the Current, Short Term and Long-term Stages are presented in Table 10-3. The monitoring location is the same as it is for the current consent being the point of discharge from the UV disinfection system prior to discharging to the overland flow system.

Table 10-3: Beachlands WWTP Proposed Treated Wastewater Quality Summary

Parameter	Units	Existing WWTP				New WWTP	
		Current		Short-Term Upgrade		Long-Term Stages 1 and 2	
		Median	95th %ile	Median	95th %ile	Median	95th %ile
BOD	mg/L	7.0	15	7.0	15	5.0	9.0
TSS	mg/L	7.0	15	7.0	15	5.0	9.0
NH_4-N	mg/L	0.6	3.0	0.6	3.0	0.5	3.0
NO_x-N	mg/L	3.5	11	3.5	11	2.0	4.5
SIN	mg/L	4.1	14	4.1	14	2.5	7.5
DRP	mg/L	1.0	3.0	1.0	3.0	0.5	1.0
Faecal coliforms	cfu/100 mL	<10	100	<10	100	<10	100

As noted above, because the WWTP Short-term upgrade prior is designed solely to increase plant capacity, no change in discharge limits is proposed for the Short-term upgrade. The proposed discharge limits for the existing WWTP shown above are lower than those in the current resource consent (see Table 2-1). Further improvements in discharge limits are proposed for the Long-term Stage 1 upgrade, once the new MBR WWTP is operational.

It is proposed that treated wastewater samples be taken on a weekly basis and analysed for the parameters shown in Table 10-3:. It is also proposed that a trigger level for conductivity and salinity be set for the influent to the WWTP which would require investigations to be undertaken into the sources should the trigger levels be exceeded.

10.4 Receiving Environment Water Quality Monitoring

As noted earlier in this application, water quality samples have been collected from a number of sites during the course of investigations for this application.

It is proposed that a water quality monitoring programme be implemented for the duration of the consent period to measure water quality in the receiving environment and to ascertain any changes in water quality attributable to the discharge from the WWTP. The water quality monitoring locations will be identified as part of the monitoring programme outlined in the Environmental Monitoring Plan. Suggested monitoring parameters, to be collected in monthly samples, are shown in Table 10-4.

Table 10-4: Beachlands WWTP Receiving Environment Water Quality Monitoring Parameters

Parameter	Units	Sites
Dissolved Oxygen	mg/L	All
pH		All
Temperature	°C	All
Conductivity	mS/m	All
Total Suspended Solids	mg/L	All
Faecal Coliforms	cfu/100mL	All
Carbonaceous Biochemical Oxygen Demand	mg/L	All
Ammoniacal-N (NH4-N)	mg/L	All
Nitrate plus Nitrite-N (NOx-N)	mg/L	All

Parameter	Units	Sites
Total Nitrogen (TN)	mg/L	All
Dissolved Reactive Phosphorus (DRP)	mg/L	All
Total Phosphorus (TP)	mg/L	All

10.5 Overland Flow Design and Operation Management Plan

Regarding the development of the Overland Flow System, Watercare will invite Ngāi Tai ki Tāmaki to partner in a co-design process to design and develop the expanded overland flow system for the ongoing discharges from the WWTP within the Watercare site.

Watercare propose that the final design be set out in an Overland Flow Design and Operation Management Plan (**OFDOMP**) which, as a minimum, will include:

1. A review of the design of the existing overland flow system and pond to ensure that it aligns with good practice including application rate, residence time, the periodic resting of zones within the overland flow area, and the capacity and potential erosion risk of the culvert at the downstream end of the farm pond.
2. Detailed design plans for the Overland Flow System, including any pond / wetland element that is part of the system.
3. A description of the cultural design input and how this has been incorporated into the final design of the Overland Flow System.
4. A description of how the location and design the proposed additional overland flow system:
    a. Avoids and mitigates potential adverse effects on the ecological values of riparian areas, wetlands and aquatic habitats, including application of an effects management hierarchy where appropriate.
    b. Ensures the future overland flow system has an appropriate area slope and gradient. This includes earthworks, slope length, soil conditions, vegetation cover and erosion control.
    c. Ensures that future wastewater flows, including wet weather flows, are provided for.
    d. Aligns with good practice in relation to:
        i. dispersal method.
        ii. wastewater application rate.
        iii. residence time.
        iv. periodic resting of zones within the overland flow area(s).
        v. management of vegetation, including harvesting where this will contribute to the treatment benefits of the overland flow areas.
    e. Ensures diffuse entry of the overland flow into the stream.
5. Operational management of all overland flow systems for the WWTP.

6. Description of the ongoing monitoring and maintenance requirements associated with the Overland Flow System.

The OFDOMP could be developed in phases. With the matters set out in 1. above undertaken within six months of the granting of the consent, and the matters set out in 2. and 3. above developed in conjunction with the Short-term upgrades to the existing WWTP.

10.6 Riparian Planting

To minimise potential erosion and scour of the banks of the tributary to Te Puru Stream during storm events, infill riparian planting with deep rooting vegetation will be undertaken within the more vulnerable meandering reaches of the tributary within the Watercare site boundary. A riparian planting plan should be included in the Environmental Management Plan that details the planting locations, plant species and proposed maintenance.

10.7 Benthic Habitat Monitoring

Watercare recognises that over time, mass loads of some contaminants being discharged may increase as population growth occurs, even though contaminant concentrations are reduced in comparison with the existing discharge.

To address this issue, it is proposed to undertake ecological and sediment quality monitoring in the vicinity of and downstream of the farm pond. The monitoring locations will be set out in the Environmental Management Plan.

Monitoring should include:

- Benthic ecology monitoring.
- Sediment texture, organic carbon content, and total nitrogen and total phosphorus concentrations.
- Heavy metals.
- Macroalgal cover and extent.

10.8 Emerging Organic Contaminants

Although the ecological assessment concluded that majority of EOCs will present negligible ecological effects, it is recognised that this area is subject to ongoing research. To better understand the risks associated with EOCs, Watercare proposes to:

- Undertake a EOC risk assessment within six months of commissioning the Short Term upgrade to the existing WWTP. The risk assessment should include:
  - Review changes in the state of knowledge of emerging contaminants.
  - Methods for identifying, measuring, and assessing EOCs.
  - Comparison of results from previous monitoring.
- Repeat the risk assessment at 5 yearly intervals and within six months of commissioning the new WWTP (MBR) Long-term Stage 1 and Long-term Stage 2.

10.9 Environmental Management Plan

Watercare proposes the development and implementation of an Environmental Management Plan (EMP) for the WWTP to integrate operational management and maintenance, treated wastewater and environmental monitoring and reporting.

The EMP should include the following information:

- Service area information including population growth.
- Inspection and maintenance activities.
- Monitoring and reporting (flows, treated wastewater quality, water quality monitoring, other environmental monitoring).
- Sampling methodology and sampling locations.
- Contingency and incident management procedures.

- Complaints procedures.

The EMP will be submitted to Auckland Council within six months of the resource consent commencing and within six months of any upgrades to the WWTP and the commissioning of the new WWTP.

10.10 Annual Reporting

Consistent with Watercare's standard operating procedures for WWTPs Watercare proposes to prepare an Annual Monitoring Report, covering the period from 1 July to 30 June. The report will include:

- Monitoring data collected for that year, data analysis and trends.
- Compliance reporting.
- WWTP performance reporting.
- Monitoring and modelling of population growth within the WWTP catchment.
- Record of complaints.

In the event of any non-compliance, discussion of the reasons for the non-compliance and a timetable to rectify any non-compliance will be provided.

10.11 Community Liaison Group

Watercare is committed to keeping the Beachlands Maraetai community and other stakeholders informed the WWTP and the discharge activities throughout the term of any consent granted. To this end, Watercare proposes to establish the Beachlands WWTP Community Liaison Group, which is proposed to meet once a year to:

- Discuss WWTP operation, performance, complaints, investigations and planned upgrade works, and the effects or potential effects of these on the community and receiving environment.
- Make recommendations on appropriate changes to the monitoring framework to better understand the effects of the WWTP on the receiving environment.
- Discuss updates on issues that have been resolved.
- Consider other issues raised by either the Community Liaison Group or Watercare.

The Community Liaison Group will be provided with copies of the reports required to be prepared by resource consent conditions.

10.12 Monitoring and Technology Reviews

Watercare is committed to ongoing investigations to improve the quality of the treated wastewater discharge, reduce the amount of wastewater generated by the Beachlands Maraetai community and the beneficial reuse of treated wastewater. To this end Watercare proposed development of a Monitoring and Technology Review Report and regular reviews of the report. The report should include:

- An assessment of ongoing compliance with the requirements of the resource consent particularly in relation to any reported non-compliance with consent conditions.
- An assessment of compliance/consistency with any relevant national or regional water quality policies, environmental standards or guidelines in effect at the time.
- An assessment of the results of the consent holder's monitoring undertaken in accordance with these consents, including the adequacy and scope of such monitoring.
- A summary of any residual actual or potential adverse effects of the treated wastewater discharge.
- An outline of significant technological changes and advances in relation to wastewater management, inflow reduction, treatment, discharge and beneficial reuse technologies (including potable and non-potable use) that could be of relevance for possible future use.

- An assessment of whether any newly available technology option(s) or combination of options identified represent the BPO to minimise the potential and actual adverse effects of the treated wastewater discharge and whether the consent holder intends to adopt that BPO and Incorporate such technologies.

11. Summary of Effects

Sections 5 to 9 of this application provide an assessment of the potential effects from the proposed discharge of treated wastewater, with more detailed assessments provided in the corresponding Appendices.

A range of positive effects will arise from operation of the WWTP and wider Beachlands-Maraetai wastewater treatment scheme, which could not operate without a treated wastewater discharge at the end of the treatment process. These positive effects are associated with the provision of a safe and reliable public health sanitation system for the community, treating wastewater to ensure good ecological health outcomes and the facilitation of future development within the community. They also include the consolidation of three potential wastewater discharges (the other two being from the PPC 88 area and quarry) into a single, high quality discharge.

Potential adverse effects may arise with respect to the tributary of Te Puru Stream, Te Puru Stream, the discharge to land and the coastal marine area.

With respect to the discharge to land, the AEE identifies that potential adverse effects may arise in relation to terrestrial ecological values and groundwater quality. The AEE concludes that any such adverse effects will be very low given proposed design and operational measures.

With respect to effects on Te Puru Stream, the AEE evaluates potential hydrological impacts, potential effects on the water quality of the stream and potential effects on stream ecology. It identifies that the level of these adverse effects, relative to the existing environment, will range from negligible to moderate (in combination with effects generated by other catchment stressors such as nutrient input from adjacent farmland). Further, relative to the current state, the proposed improvements in the treated wastewater quality will result in material improvement to several stream attributes.

Finally with respect to potential adverse effects on the coastal marine area, the AEE evaluates potential effects that may arise due to salinity, nutrients and microbiological contaminants. The AEE identifies that due to dilution and the proposed treatment improvements such effects will be negligible to low.

Watercare is continuing to work with Ngāi Tai ki Tāmaki to understand the effects of the treated wastewater discharge on Te Taiao, Te Puru Stream and its tributaries, and Ngāi Tai ki Tāmaki ‘s special connection to these, and to develop additional mitigations and remedies to assist in addressing these effects. Watercare is continuing to engage with Ngāi Tai ki Tāmaki throughout the project and Watercare has committed to support them in the development of a Cultural Impact Assessment.

12. Statutory Assessment

12.1 RMA Requirements

12.1.1 Section 104

Section 104 of the RMA sets out the matters that the consent authority must have regard to when considering the resource consent application. These matters provide the framework for this statutory assessment and are reproduced below.

(1) When considering an application for a resource consent and any submissions received, the consent authority must, subject to Part 2 and section 77M[27], have regard to–

(a) any actual and potential effects on the environment of allowing the activity; and

(ab) any measure proposed or agreed to by the applicant for the purpose of ensuring positive effects on the environment to offset or compensate for any adverse effects on the environment that will or may result from allowing the activity; and

(b)any relevant provisions of—

(i) a national environmental standard:

(ii) other regulations:

(iii) a national policy statement:

(iv) a New Zealand coastal policy statement:

(v) a regional policy statement or proposed regional policy statement:

(vi) a plan or proposed plan; and

(c) any other matter the consent authority considers relevant and reasonably necessary to determine the application.

The actual and potential effects on the environment of allowing the activity (s104(1)(a)) are addressed in sections 5-9 and 11 above. The matters in s104(1)(b) and(c) hat are considered relevant to the consent application are identified and summarised in the following sections, as is s104(2A) relating to the value of the consent holder's investment.

12.1.2 Section 105

As the application is for a discharge permit, s105 of the RMA applies. It requires that:

(1) If an application is for a discharge permit or coastal permit to do something that would contravene section 15 or section 15B, the consent authority must, in addition to the matters in section 104(1), have regard to—

(a) the nature of the discharge and the sensitivity of the receiving environment to adverse effects; and

(b) the applicant's reasons for the proposed choice; and

(c) any possible alternative methods of discharge, including discharge into any other receiving environment.

[27] Section 77M relates to the effects of the incorporation of MDRS in a district plan and is not considered relevant to this application.

In terms of paragraph (a), this application outlines the nature of the proposed discharge and the sensitivity of the receiving environment (both freshwater and marine).

Watercare's reasons for the proposal (paragraph(b)) are also outlined in this application, and in the Alternatives Assessment Report. Watercare's mission is reliable, safe, and efficient wastewater services. Watercare is responsible for collecting, treating, and disposing of the wastewater from the Beachlands Maraetai community. The discharge of treated wastewater cannot practicably be avoided as it cannot be turned off and there are currently no practicable reuse opportunities that could avoid completely a discharge of treated wastewater to the natural environment. As such, the discharge needs to go to a receiving environment.

In terms of paragraph (c), as set out in section 2 and the Alternatives Assessment Report a range of receiving environments were considered for the discharge of treated wastewater from the WWTP. These included the discharge to the CMA, the discharge to land, the discharge to range of freshwater bodies, conveyance to other Watercare wastewater treatment plants and potable and non-potable reuse.

12.1.3 RMA Section 107 Restriction on grant of certain discharge permits

Section 107 specifically applies to any discharge of contaminants into water and onto or into land in circumstances which may result in that contaminant (or any other contaminant emanating as a result of natural processes from that contaminant) entering water. Section 107(1) states that a resource consent shall not be granted if:

> ...
>
> *after reasonable mixing, the contaminant or water discharged (either by itself or in combination with the same, similar, or other contaminants or water), is likely to give rise to all or any of the following effects in the receiving waters:*
>
> *(c) the production of any conspicuous oil or grease films, scums, or foams, or floatable or suspended materials:*
>
> *(d) any conspicuous change in the colour or visual clarity:*
>
> *(e) any emission of objectionable odour:*
>
> *(f) the rendering of fresh water unsuitable for consumption by farm animals:*
>
> *(g) any significant adverse effects on aquatic life.*

The high level of treatment of the wastewater prior to discharge from all 4 stages of improvements to the WWTP and in particular the new (MBR) WWTP Long-term Stage 1 and Stage 2 which includes the very fine membranes of the MBR treatment process will ensure the production of any conspicuous oil or grease films, scums, or foams, or floatable or suspended materials does not occur in the Te Puru Stream and associated tributaries (s107(1)(c)).

The assessment of effects (see section 7.2.1) identifies that:

- The current WWTP discharge has consistently low TSS.
- There is little difference in TSS for the receiving environment sites upstream and downstream of the WWTP discharge.
- Discharge standards for the new (MBR) WWTP Long-term Stage 1 and Stage 2 are expected to result in an approximate 1.4-fold decrease in TSS and therefore contribute to improved water quality downstream of the discharge.

Based on these findings it is not expected that the discharge (under any of the 4 stages) will result in any conspicuous change in colour or visual clarity after reasonable mixing (s107(1)(d)).

There will be no emission of objectionable odour associated with the proposed discharge (s107(1)(e) due to the high level of treatment of the wastewater.

The QRMA[28] has identified that due to high levels of faecal indicator bacteria in the Te Puru Stream, the stream is an unsuitable source of stock drinking water. The high levels of faecal indicator bacteria are attributed to other activities in the Te Puru catchment and not to the discharge from the WWTP (s107(1)(f)).

The findings of the ecological assessment concludes that the level of adverse effects on stream ecology, relative to the existing environment, will range from negligible to potentially moderate (when considered in combination with other catchment stressors) and relative to the current state, the proposed improvements in the treated wastewater quality will result in material improvement to several stream attributes. Consequently, the proposed discharge should not result in significant adverse effects on aquatic life (s107(1)(g)).

Based on the above findings it is unlikely that the proposed discharge from any of the 4 stages of upgrades to the WWTP will result in any of the effects identified in s107(1)(c) to (g) downstream of the potential mixing zone – Bridge site (15) approximately 350 m below the pond discharge. Site 15 has been identified as a potential mixing zone as it is sufficiently downstream to accommodate reasonable mixing from the existing farm pond and diffuse discharge from the proposed areas identified as potentially suitable for an expansion of the Beachlands overland flow system. Between the farm pond and the Bridge site is also Watercare land[29].

12.2 Relevant National Planning Instruments

The following provides a summary of the key provisions of the national planning instruments that under s104(1)(b) of the RMA the consent authority must have regard to when considering the application.

12.2.1 National Policy Statement for Freshwater Management 2020 (Updated 2023)

The NPS-FM is relevant to the proposal as it involves a discharge to land that will enter freshwater.

The fundamental concept of Te Mana o te Wai introduced by the NPS-FM establishes the overarching framework for the consideration of the effects of the wastewater discharges on freshwater receiving environments such as the Te Puru stream and its associated tributaries.

Te Mana o te Wai incorporates the following hierarchy of obligations:

a. first, the health and well-being of water bodies and freshwater ecosystems.

b. second, the health needs of people (such as drinking water).

c. third, the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future.

This hierarchy is reflected in the only objective of the NPS-FM.

Te Mana o te Wai encompasses six principles relating to the roles of tangata whenua and other New Zealanders in the management of freshwater, and these principles inform the NPS-FM and its implementation. The six principles are:

1) *Mana whakahaere: the power, authority, and obligations of tangata whenua to make decisions that maintain, protect, and sustain the health and well-being of, and their relationship with, freshwater.*

2) *Kaitiakitanga: the obligation of tangata whenua to preserve, restore, enhance, and sustainably use freshwater for the benefit of present and future generations.*

3) *Manaakitanga: the process by which tangata whenua show respect, generosity, and care for freshwater and for others.*

[28] Beachlands WWTP Discharge: Assessment of microbiological effects and health risk, NIWA March 2024, page 6

[29] Beachlands Wastewater Treatment Plant – water quality, ecological and human health effects assessment, Aquatic Environmental Sciences, Coast & Catchment, Streamlined Environmental. April 2024, Footnote 2.

4) *Governance: the responsibility of those with authority for making decisions about freshwater to do so in a way that prioritises the health and well-being of freshwater now and into the future.*

5) *Stewardship: the obligation of all New Zealanders to manage freshwater in a way that ensures it sustains present and future generations.*

6) *Care and respect: the responsibility of all New Zealanders to care for freshwater in providing for the health of the nation.*

Key themes from the policies in the NPS-FM include that:

- Freshwater is managed in a way that gives effect to Te Mana o te Wai (Policy 1).
- Tangata whenua are actively involved in freshwater management (including decision-making processes), and Māori freshwater values are identified and provided for (Policy 2).
- The health and wellbeing of waterbodies is maintained or, where degraded, improved (Policy 5).
- The loss of river extent and values is avoided to the extent practicable (Policy 7).
- There is no further loss of the extent of natural inland wetlands, their values are protected, and their restoration is promoted (Policy 6).
- The habitats of indigenous freshwater species are protected (Policy 9).
- The condition of freshwater is systematically monitored over time, and action is taken where freshwater is degraded, and to reverse deteriorating trends (Policy 13).
- Communities are enabled to provide for their social, economic, and cultural well-being in a way that is consistent with this National Policy Statement (Policy 15).

Based on the information available to date (noting that Ngāi Tai ki Tāmaki is preparing a CIA for the proposal), it is considered that the proposal is generally consistent with the NPS-FM because:

- From a technical perspective, the proposed new (MBR) WWTP (Stage 1 and Stage 2) will contribute to giving effect to Te Mana o te Wai because the quality of the treated wastewater discharge from the new WWTP to the tributary of Te Puru Stream and ultimately Te Puru Stream is very high, particularly with the proposed membranes and the UV treatment.
- Watercare propose a comprehensive monitoring regime to detect the occurrence of any adverse effects of the discharge on the tributary of Te Puru Stream and Te Puru Stream.
- The proposed wastewater scheme will enable the continuation of a safe and reliable public health sanitation system for both the existing and future communities of Beachlands and Maraetai, which in turn will support community well-being and growth.
- The OFDOMP will identify if any natural inland wetlands will be affected by the proposed works. The plan, which Watercare will invite Ngāi Tai ki Tāmaki to partner in the development of, will ensure the design and operation of the overland flow system avoids, mitigates or offsets potential adverse effects on the ecological values of riparian areas, wetlands and aquatic habitats.
- Key findings from the water quality and ecological assessment are that the downstream sites would be classified as degraded compared with the existing environment (reference upstream sites) for nitrate-N, DRP and macroinvertebrate indices but the proposed reduction in nitrate-N from the upgraded WWTP (significant improvements once the MBR WWTP is installed) will likely contribute to improved stream health and potentially ecological communities downstream compared to the current WWTP discharge.[30] .
- Based on the ecological assessment findings, over the longer term the treated wastewater discharge from the new (MBR) WWTP Long-term (Stage 1 and Stage 2) should potentially contribute to improving the health and well-being

[30] Beachlands Wastewater Treatment Plant – water quality, ecological and human health effects assessment, Aquatic Environmental Sciences, Coast & Catchment, Streamlined Environmental. April 2024, page 16

of the tributary to the Te Puru Stream and to the stream itself, to avoiding further loss of stream values, and to protecting habitats of indigenous freshwater species.

The assessment of the NPS-FM can be updated following the receipt of the Ngāi Tai ki Tāmaki CIA for the proposal.

12.2.2 New Zealand Coastal Policy Statement 2010

The NZCS has some relevance to the proposal as the treated wastewater is discharged to a tributary of the Te Puru Stream which ultimately discharges into the Te Puru Stream estuary / Te Maraetai / Kellys Beach some 4km downstream from the WWTP site.

Relevant key provisions in the NZCPS seek to:

- Safeguard the integrity, form, functioning and resilience of the coastal environment and sustain its ecosystems (Objective 1).
- Preserve the natural character of the coastal environment and protect natural features and landscape values (Objective 2).
- Take account of the principles of the Treaty of Waitangi, recognise the role of tangata whenua as kaitiaki and provide for tangata whenua involvement in management of the coastal environment (Objective 3).
- Protect indigenous biological diversity in the coastal environment (Policy11).
- Manage discharges of human wastewater and do not allow the discharge of treated human sewage to water in the coastal environment, unless:
  - there has been adequate consideration of alternative methods, sites and routes for undertaking the discharge; and
  - informed by an understanding of tangata whenua values and the effects on them (Policy 23).
- Maintain and enhance recreation opportunities (Objective 4).
- Enable people and communities to provide for their social, economic, and cultural wellbeing, and health and safety (Objective 6).
- Recognise that the provision of infrastructure in the coastal environment is important for the well-being of people and communities. (Policy 6).

Based on the information available to date (noting that Ngāi Tai ki Tāmaki is preparing a CIA for the proposal), it is considered that the proposal is generally consistent with the NZCPS because:

- The proposal does not involve the direct discharge of untreated human sewage to the coastal environment. The highly treated wastewater is discharged to a tributary of the Te Puru Stream, the Te Puru Stream which ultimately discharges to the Te Puru Estuary / CMA.
- The proposed wastewater scheme will enable the continuation of a safe and reliable public health sanitation system for both the existing and future communities of Beachlands and Maraetai, which in turn will support community well-being and growth.
- The findings of the ecological assessment in relation to the effects if the proposed discharge ecosystems and water quality in the CMA[31] are summarised as follows:
  - The proposed discharge rates from the new WWTP (MBR) Long-term (Stage 2) will have negligible effects on the salinity and the marine communities of Te Maraetai / Kellys Beach due to the relatively low discharge rates compared to other nearby streams and rivers, the rapid dilution, and the tolerance of intertidal biota to low salinities. There will be no change from the current WWTP scenario.
  - Nitrogen, and to a lesser extent, phosphorus, are the two primary limiting nutrients of concern in coastal waters. Concentrations of these nutrients from the new WWTP (MBR) Long-term (Stages 1 and 2) will be

[31] Beachlands Wastewater Treatment Plant – water quality, ecological and human health effects assessment, Aquatic Environmental Sciences, Coast & Catchment, Streamlined Environmental. April 2024, page 17.

significantly diluted by the time they reach the Te Puru Stream mouth, making them well below background concentrations in coastal waters. Given the rapid dilution rate, no increase in nutrient concentrations in coastal waters, or related adverse effects from increased nutrients, are likely to occur. There will be no change from the current WWTP scenario.

- Given that the estimated TN and TP loads from the new WWTP (MBR) Long-term (Stages 1 and 2) represent a very small percentage of the TN and TP loads entering the inner Hauraki Gulf and Firth of Thames, the effects of the increased loads from the new WWTP are assessed to be less than minor. Other minor contaminants that are present in the treated wastewater at low concentrations will be diluted at a similar rate to TN and TP.

- Given that the proposed treated wastewater will be discharged to a tributary of the Te Puru Stream some 4 km upstream from where Te Puru Stream ultimately discharges to the CMA (Te Puru Estuary / Te Maraetai / Kellys Beach), it is considered highly unlikely that the discharge will result in any adverse effects the natural character of the coastal environment.
- Given the findings of the water quality and ecological assessment over the longer term the treated wastewater discharge from the new WWTP (MBR) Long-term (Stages 1 and 2) should contribute to sustaining the coastal environment's ecosystems and to protecting its indigenous biological diversity.
- The log reduction to be achieved by the new WWTP will reduce risks for shellfish consumption and for swimming to below 1% at all marine sites used for the QMRA and therefore any adverse effects on public health and recreation are anticipated to be very low.

The assessment of the NZCPS can be updated following the receipt of the Ngāi Tai ki Tāmaki CIA for the proposal.

12.2.3 National Environmental Standard for Freshwater 2020 (Updated 2024)

As set out in Section 4, no consents have currently been sought under the National Environmental Standard for Freshwater (**NES-F**) for the proposed scheme. Once detailed design of the extended overland flow system has been undertaken there will be sufficient information to determine the location of any natural inland wetlands in relation to the proposed works and the extent to which any wetlands will be affected. If any consents are identified as being required under the NES-F they will be sought in conjunction with any other required consents.

12.2.4 Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011

As set out in Section 4, no consents have currently been sought under the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations (**NES Contaminated Soil**). Once detailed design of the new WWTP and the extended overland flow system has been undertaken there will be sufficient information to determine the location of any contaminated soil in relation to the proposed works. If any consents are identified as being required under the NES Contaminated Soil they will be sought in conjunction with any other required consents.

12.2.5 National Policy Statement for Indigenous Biodiversity 2023

The National Policy Statement on Indigenous Biodiversity (**NPS-IB**) applies to indigenous biodiversity in the terrestrial environment.

The NPS-IB prioritises the mauri and intrinsic value of indigenous biodiversity and recognises people's connections and relationships with indigenous biodiversity while recognising the relationship between indigenous species, ecosystems, the wider environment, and the community and in particular the bond between tangata whenua and indigenous biodiversity and obligations of care that tangata whenua have as kaitiaki of indigenous biodiversity among other principles.

To the extent that it is necessary, the NPS-IB will be taken into account as part of the detailed design process for the extended overland flow system and the for the upgrades / new WWTP. It is noted however that the expansion of the overland flow system and improvements to the current system provide the opportunity to increase the extent of indigenous flora on the WWTP site.

12.3 Auckland Unitary Plan operative in part (Updated 8 March 2024)

12.3.1 Regional Policy Statement

The following provides a summary assessment of the key objectives and policies of the Regional Policy Statement (RPS) that under s104(1)(b) of the RMA the consent authority must have regard to when considering the application.

Relevant key provisions in the RPS seek to:

- The quality of freshwater and coastal water is maintained where it is excellent or good and progressively improved over time where it is degraded (Objective B7.4.1(2).
- The adverse effects of point and non-point discharges, in particular stormwater runoff and wastewater discharges, on coastal waters and freshwater are minimised and existing adverse effects are progressively reduced (Objective B7.4.1(3).
- Ensure new development is supported by wastewater infrastructure with sufficient capacity to serve the development (Policies B7.4.2).
- Adopt the best practicable option for minimising the adverse effects of discharges from wastewater treatment plants. (Policies B7.4.2).
- Progressively improve water quality in areas identified as having degraded water quality through managing subdivision, use, development and discharges (Policies B7.4.2).
- Manage discharge of contaminants into water to avoid where practicable, and otherwise minimise significant bacterial contamination, adverse effects on the quality of freshwater and coastal water) adverse effects on Mana Whenua values including wāhi tapu, wāhi taonga and mahinga kai (Policies B7.4.2).
- Development, operation, maintenance, and upgrading of infrastructure is enabled, while managing adverse effects on the quality of the environment and the health and safety of communities and amenity values (Objective B3.2.1 (3).
- The functional and operational needs of infrastructure are recognised (Objective B3.2.1 (4).
- The mauri of, and the relationship of Mana Whenua with, natural and physical resources including freshwater, land, air and coastal resources are enhanced overall Objective B6.3.1 (2).
- Recognises the role of Mana Whenua as kaitiaki and provide for the practical expression of kaitiakitanga, recognises Mana Whenua as specialists in the tikanga of their hapū or iwi and as being best placed to convey their relationship with their ancestral lands, water, sites, wāhi tapu and other taonga (Policies B6.2.2).
- The management of the Hauraki Gulf gives effect to sections 7 and 8 of the Hauraki Gulf Marine Park Act 2000 (Objective B8.5.1 (1).
- Encourage and support the restoration and enhancement of the Hauraki Gulf's ecosystems, its islands and catchments (Policies B8.5.2).

Based on the information available to date (noting that Ngāi Tai ki Tāmaki is preparing a CIA for the proposal), it is considered that the proposal is generally consistent with the RPS because:

- There is an operational need for the proposal because the current wastewater scheme is nearing capacity and will not be able to support the future growth of the Beachlands Maraetai area particularly if PPC88 and the Business Park application are approved.
- There is a functional need for the discharge of treated wastewater to the tributary of the Te Puru Stream because Watercare is responsible for collecting, treating, and disposing of the Beachlands Maraetai community's wastewater. The discharge cannot practicably be avoided as it cannot be turned off. The discharge needs to go to a receiving environment.
- An extensive range of receiving environments were considered for the discharge of treated wastewater from the WWTP. These included the discharge to the CMA, the discharge to land, the discharge to range of freshwater

bodies, conveyance to other Watercare wastewater treatment plants and potable and non-potable reuse. A comprehensive assessment of these receiving environments was undertaken, and the proposal was determined to be the BPO from a technical perspective.

- Key findings from the water quality and ecological assessment are that the downstream sites would be classified as degraded compared with the existing environment (reference upstream sites) for nitrate-N, DRP and macroinvertebrate indices but the proposed reduction in nitrate-N from the upgraded WWTP (significant improvements once the MBR WWTP is installed) will likely contribute to improved stream health and potentially ecological communities downstream compared to the current WWTP[32]will likely contribute to improved stream health and potentially ecological communities downstream.
- Based on the ecological assessment findings, over the longer term the treated wastewater discharge from the new WWTP (MBR) Long-term (Stages 1 and 2) should potentially contribute to improving the health and well-being of the tributary to the Te Puru Stream and the stream, to minimising adverse effects of the treated wastewater discharge on the quality of freshwater and to minimising any significant bacterial contamination.
- The findings of the ecological assessment in relation to the effects if the proposed discharge ecosystems and water quality in the CMA[33] are summarised as follows:
    - The proposed discharge rates from the new WWTP (MBR) Long-term (Stage 2) will have negligible effects on the salinity and the marine communities of Te Maraetai / Kellys Beach due to the relatively low discharge rates compared to other nearby streams and rivers, the rapid dilution, and the tolerance of intertidal biota to low salinities. There will be no change from the current WWTP scenario.
    - Concentrations of these nutrients from the new WWTP (MBR) Long-term (Stages 1 and 2) will be significantly diluted by the time they reach the Te Puru Stream mouth, making them well below background concentrations in coastal waters. Given the rapid dilution rate, no increase in nutrient concentrations in coastal waters, or related adverse effects from increased nutrients, are likely to occur. There will be no change from the current WWTP scenario.
    - Given that the estimated TN and TP loads from the new WWTP (MBR) Long-term (Stages 1 and 2) represent a very small percentage of the TN and TP loads entering the inner Hauraki Gulf and Firth of Thames, the effects of the increased loads from the new WWTP are assessed to be less than minor. Other minor contaminants that are present in the treated wastewater at low concentrations will be diluted at a similar rate to TN and TP.
- Given the findings of the water quality and ecological assessment, over the longer term the treated wastewater discharge from the new WWTP (MBR) Long-term (Stages 1 and 2) should contribute to enhancing the Hauraki Gulf's ecosystems, to minimising adverse effects on the quality of coastal water and to minimising any significant bacterial contamination.

The assessment of the RPS can be updated following the receipt of the Ngāi Tai ki Tāmaki CIA for the proposal.

12.3.2 Regional Plan

The following provides a summary assessment of the key objectives and policies of the Regional Plan that under s104(1)(b) of the RMA the consent authority must have regard to when considering the application.

Relevant key provisions in the Regional Plan seek to:

- Avoid the discharge of wastewater from wastewater treatment plants to freshwater, unless:
    - alternative methods and sites for the discharge have been considered and are not the best practicable option.
    - Mana Whenua have been consulted in accordance with tikanga Māori and due consideration has been given to section 6, section 7 and section 8 of the RMA.

[32] Beachlands Wastewater Treatment Plant – water quality, ecological and human health effects assessment, Aquatic Environmental Sciences, Coast & Catchment, Streamlined Environmental. April 2024, page 16

[33] Beachlands Wastewater Treatment Plant – water quality, ecological and human health effects assessment, Aquatic Environmental Sciences, Coast & Catchment, Streamlined Environmental. April 2024, page 17.

- the affected community has been consulted regarding the suitability of the treatment and disposal system to address any environmental effects.
- the extent to which adverse effects have been avoided where practicable, or otherwise remedied or mitigated in areas of high recreational use, or areas that are used for fishing or shellfish gathering, commercial or residential development, significant ecological value (Policy E1.3 (18)).

- Freshwater and sediment quality is maintained where it is excellent or good and progressively improved over time in degraded areas (Objective E1.2 (1)).
- The mauri of freshwater is maintained or progressively improved over time to enable traditional and cultural use of this resource by Mana Whenua (Objective E1.2 (2)).
- Wastewater networks are managed to protect public health and safety and to prevent or minimise adverse effects of contaminants on freshwater and coastal water quality (Objective E1.2 (3)).
- Manage discharges having regard to NPS-FM national bottom lines and the Macroinvertebrate Community Index and enhance water quality, flows, stream channels and their margins and other freshwater values where the current condition is below national bottom lines or the relevant Macroinvertebrate Community Index guideline (Policy E1.3 (1)).
- Auckland's streams are restored, maintained or enhanced. Significant residual adverse effects on streams that cannot be avoided, remedied or mitigated are offset where this will promote the purpose of the RMA (Objectives E3.2).
- Avoid significant adverse effects and avoid where practicable or otherwise remedy or mitigate other adverse effects of activities in, on, under or over the beds of streams or wetlands within SEAs (Policy E3.3 (1)).
- Protect the riparian margins of streams from inappropriate use and development and promote their enhancement (Policy E3.3 (15)).
- Avoid the discharge of contaminants in the CMA where it will result in significant modification of, or damage to any areas identified as having significant values (Policy F2.11.3 (1)).

Based on the information available to date (noting that Ngāi Tai ki Tāmaki is preparing a CIA for the proposal), it is considered that the proposal is generally consistent with the Regional Plan because:

- An extensive consideration of alternative receiving environments was undertaken to determine the preferred wastewater scheme and to determine that the proposed scheme was the BPO.
- Watercare has engaged extensively with the Beachlands Maraetai community and other stakeholders through the various stages of the option selection process which included a comparison of the various effects of the options.
- The option assessment process took into account areas of high recreational use, or areas that are used for fishing or shellfish gathering and the selected option avoids these areas.
- The log reductions required by the QMRA from the WWTP Short Term and Long-term Stages can be achieved and therefore the public health effects from the treated wastewater discharge are anticipated to be low.
- The OFDOMP will identify if any natural inland wetlands will be affected by the proposed works. The plan will ensure the design and operation of the overland flow system avoids, mitigates or, if required, offsets potential adverse effects on the ecological values of riparian areas, wetlands, and aquatic habitats.
- Key findings from the water quality and ecological assessment are that the downstream sites would be classified as degraded compared with the existing environment (reference upstream sites) for nitrate-N, DRP and macroinvertebrate indices but the proposed reduction in nitrate-N from the upgraded WWTP (significant improvements once the MBR WWTP is installed) will likely contribute to improved stream health and potentially ecological communities downstream compared to the current discharge from the WWTP[34].
- Based on the ecological assessment findings, over the longer term the treated wastewater discharge from the new WWTP (MBR) Long-term (Stages 1 and 2) will result in an improvement in water quality compared to the current

[34] Beachlands Wastewater Treatment Plant – water quality, ecological and human health effects assessment, Aquatic Environmental Sciences, Coast & Catchment, Streamlined Environmental. April 2024, page 16

water quality results and is highly likely to result in an improvement in the overall macroinvertebrate and fish community downstream compared to the most recent survey results..

- OFDOMP should ensure the design and operation of the overland flow system avoids, mitigates or offsets potential adverse effects on the SEA_T_428. The implementation of the proposed wastewater scheme will avoid SEA_T_5259.
- Potential effects on SEA-M1-42b Te Puru Stream estuary and SEA-M2-42a are anticipated to be less than minor given the level of influence the treated wastewater discharge will have on nutrient concentrations and salinity in coastal waters.
- The increase in discharge volume is not expected to have significant adverse effects on stream bank conditions or native fauna habitats along the tributary of the Te Puru stream. Infill riparian planting with deep rooting vegetation is proposed along the tributary of Te Puru Stream within the Watercare site to minimise erosion and scour associated with any increase in the discharge volume[35].

The assessment of the Regional Plan can be updated following the receipt of the Ngāi Tai ki Tāmaki CIA for the proposal.

12.4 Hauraki Gulf Marine Park Act 2000

The Hauraki Gulf Marine Park Act 2000 (**HGMPA**) is relevant to the proposal as the treated wastewater is discharged to a tributary of the Te Puru Stream which ultimately discharges into the Te Puru Stream estuary and the CMA in the Hauraki Gulf and s9(4) of the HGMPA requires that a consent authority must, when considering an application for a resource consent for the Hauraki Gulf, its islands, and catchments, have regard to sections 7 and 8 in addition to the matters contained in the RMA.

Sections 7 and 8 of the HGMPA are set out below.

7 Recognition of national significance of Hauraki Gulf

(1) The interrelationship between the Hauraki Gulf, its islands, and catchments and the ability of that interrelationship to sustain the life-supporting capacity of the environment of the Hauraki Gulf and its islands are matters of national significance.

(2) The life-supporting capacity of the environment of the Gulf and its islands includes the capacity—

(a) to provide for—

(i) the historic, traditional, cultural, and spiritual relationship of the tangata whenua of the Gulf with the Gulf and its islands; and

(ii) the social, economic, recreational, and cultural well-being of people and communities:

(b) to use the resources of the Gulf by the people and communities of the Gulf and New Zealand for economic activities and recreation:

(c) to maintain the soil, air, water, and ecosystems of the Gulf.

8 Management of Hauraki Gulf

To recognise the national significance of the Hauraki Gulf, its islands, and catchments, the objectives of the management of the Hauraki Gulf, its islands, and catchments are—

[35] Te Puru Stream WWTP Discharge Volume Increase Assessment on Stream Habitat, Bioresearches, 2 April 2024, page 5.

(a) the protection and, where appropriate, the enhancement of the life-supporting capacity of the environment of the Hauraki Gulf, its islands, and catchments:

(b) the protection and, where appropriate, the enhancement of the natural, historic, and physical resources of the Hauraki Gulf, its islands, and catchments:

(c) the protection and, where appropriate, the enhancement of those natural, historic, and physical resources (including kaimoana) of the Hauraki Gulf, its islands, and catchments with which tangata whenua have an historic, traditional, cultural, and spiritual relationship:

(d) the protection of the cultural and historic associations of people and communities in and around the Hauraki Gulf with its natural, historic, and physical resources:

(e) the maintenance and, where appropriate, the enhancement of the contribution of the natural, historic, and physical resources of the Hauraki Gulf, its islands, and catchments to the social and economic well-being of the people and communities of the Hauraki Gulf and New Zealand:

(f) the maintenance and, where appropriate, the enhancement of the natural, historic, and physical resources of the Hauraki Gulf, its islands, and catchments, which contribute to the recreation and enjoyment of the Hauraki Gulf for the people and communities of the Hauraki Gulf and New Zealand.

Based on the information available to date (noting that Ngāi Tai ki Tāmaki is preparing a CIA for the proposal), it is considered that the proposal is generally consistent with section 7 and 8 of the HGMPA because:

- The proposed discharge is not a direct discharge to the CMA. The treated wastewater passes through an overland flow system before entering the tributary to the Te Puru Stream. The discharge enters the stream some 4 km upstream of the CMA.
- The findings of the ecological and water quality assessment in relation to the effects if the proposed discharge ecosystems and water quality in the CMA[36] are summarised as follows:
    - The proposed discharge rates from the new WWTP (MBR) Long-term (Stage 2) will have negligible effects on the salinity and the marine communities of Te Maraetai / Kellys Beach due to the relatively low discharge rates compared to other nearby streams and rivers, the rapid dilution, and the tolerance of intertidal biota to low salinities. There will be no change from the current WWTP scenario.
    - Nitrogen, and to a lesser extent, phosphorus, are the two primary limiting nutrients of concern in coastal waters. Concentrations of these nutrients from the New WWTP (MBR) Long-term Stages 1 and 2 will be significantly diluted by the time they reach the Te Puru Stream mouth, making them well below background concentrations in coastal waters. Given the rapid dilution rate, no increase in nutrient concentrations in coastal waters, or related adverse effects from increased nutrients, are likely to occur. There will be no change from the current WWTP scenario. Given that the estimated TN and TP loads from the new WWTP (MBR) Long-term (Stages 1 and 2) represent a very small percentage of the TN and TP loads entering the inner Hauraki Gulf and Firth of Thames, the effects of the increased loads from the new WWTP are assessed to be negligible. Other minor contaminants that are present in the treated wastewater at low concentrations will be diluted at a similar rate to TN and TP.
- Given the findings of the water quality and ecological assessment, over the longer term the treated wastewater discharge from the new WWTP (MBR) Long-term (Stages 1 and 2) should contribute to enhancing the Hauraki Gulf's ecosystems, to sustaining the life-supporting capacity of the environment of the Hauraki Gulf and to minimising adverse effects on the quality of coastal water.

[36] Beachlands Wastewater Treatment Plant – water quality, ecological and human health effects assessment, Aquatic Environmental Sciences, Coast & Catchment, Streamlined Environmental. April 2024, page 17.

- Given that the proposed treated wastewater will be discharged to a tributary of the Te Puru Stream some 4 km from where the stream ultimately discharges to the CMA (Te Puru Estuary / Te Maraetai / Kellys Beach) it is considered unlikely that the discharge will result in any adverse effects the natural character of the coastal environment.
- The log reduction to be achieved by the new WWTP will reduce risks for shellfish consumption and for swimming to below 1% at all marine sites used for the QMRA and therefore any adverse effects on public health and recreation are anticipated to be negligible.

12.5 Take Taiaomaurikura 2022

Ngāi Tai ki Tāmaki is preparing a CIA for the proposal which will assess the proposal against Take Taiaomaurikura.

12.6 Statutory Acknowledgements

A statutory acknowledgement is a formal acknowledgement by the Crown of the mana of tangata whenua over a specified area. It recognises the particular cultural, spiritual, historical, and traditional association of an iwi with the site, which is identified as a statutory area. Statements of statutory acknowledgements are set out in Treaty of Waitangi claim settlement legislation.

Consent authorities, the Environment Court, and Heritage New Zealand Pouhere Taonga are required to have regard to a statutory acknowledgement when determining whether the relevant iwi may be adversely affected by the granting of a resource consent for activities within, adjacent to or impacting directly on the statutory area.

As set out in Section 3, the proposal is within Ngāi Tai Ki Tāmaki Statutory Acknowledgement as described in the Ngāi Tai Ki Tāmaki Claims Settlement Act 2018. Auckland Council is required to provide Ngāi Tai Ki Tāmaki with summaries of all resource consent applications that may affect the areas named in their acknowledgements, prior to decisions being made on those applications.

As set out in section 5, Watercare is continuing to work with Ngāi Tai ki Tāmaki to understand the effects of the treated wastewater discharge to their ancestral landscape, Te Taiao, and is committed to support Ngāi Tai ki Tāmaki as partners in the process following the lodgement of the application.

12.7 RMA Part 2

Schedule 4, clause 2 of the RMA requires that an application for a resource consent must include an assessment of the activity against the matters set out in Part 2 of the Act. The following table provides this required assessment.

Table 12-1: RMA Part 2 Assessment

Part 2	Assessment
5 Purpose Promote the sustainable management of natural and physical resources. Managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural well-being and for their health and safety while— (a) sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and (b) safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and	The proposed wastewater scheme will enable communities to provide for their social and economic well-being as the scheme will enable the continuation of a safe and reliable public health sanitation system for both the existing and future population of the Beachlands Maraetai community. The proposed long-term MBR WWTP will result in an improvement in water quality compared to the current water quality results and is highly likely to result in an improvement in the overall macroinvertebrate and fish community downstream compared to the most recent survey results. The level of adverse effects on stream ecology, relative to the existing environment, will range from negligible to potentially moderate (when considered in combination with other catchment stressors) and the proposed improvements in the treated wastewater

(c) avoiding, remedying, or mitigating any adverse effects of activities on the environment.	quality will result in material improvement to several stream attributes. Adverse effects from the discharge to land on terrestrial ecological values and groundwater quality are considered to be very low given proposed design and operational measures. Based on the above findings the proposed discharge should not result in significant adverse effects on the environment and should contribute to safeguarding the life-supporting capacity of water, soil, and ecosystems. The risks to recreational users of the stream and CMA downstream of the discharge have been assessed using Quantitative Microbiological Risk Assessment. The assessment has concluded that the log reduction to be achieved by the Short-term upgrades and new WWTP Long-term WWTP (Stages 1 and 2) will reduce risks for watercress and shellfish consumption and for swimming to below 1% at the sites used for the QMRA. Therefore, any adverse effects on public health and recreation are anticipated to be low to negligible.
6 Matters of national importance Recognise and provide for the following matters of national importance: (a) the preservation of the natural character of wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development: (b) the protection of outstanding natural features and landscapes from inappropriate subdivision, use, and development: (c) the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna: (d) the maintenance and enhancement of public access to and along rivers: (e) the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, wāhi tapu, and other taonga: (f) the protection of historic heritage from inappropriate subdivision, use, and development: (g) the protection of protected customary rights: (h) the management of significant risks from natural hazards.	The natural character of the tributary of the Te Puru Stream and its margins within the Watercare site should be enhanced as a result of proposed riparian planting. There are no outstanding natural features or landscapes, affected by the proposed treated wastewater discharge. OFDOMP should ensure the design and operation of the overland flow system avoids, mitigates or offsets potential adverse effects on the SEA_T_428. The implementation of the proposed wastewater scheme will avoid SEA_T_5259. Potential effects on SEA-M1-42b Te Puru Stream estuary and SEA-M2-42a are anticipated to be low given the level of influence the treated wastewater discharge will have on nutrient concentrations and salinity in coastal waters. The proposed treated wastewater discharge does not affect any identified archaeological sites. Ngāi Tai ki Tāmaki is preparing a CIA for the proposal which will provide information on s6(e) matters and other section 6 matters of importance to Ngāi Tai ki Tāmaki.
7 Other matters	Watercare is working with Ngāi Tai ki Tāmaki to acknowledge and recognise their kaiitiaki role through opportunities for ongoing involvement in the

Have particular regard to (a) kaitiakitanga: (aa) the ethic of stewardship: (b) the efficient use and development of natural and physical resources: (ba) the efficiency of the end use of energy: (c) the maintenance and enhancement of amenity values: (d) intrinsic values of ecosystems: (f) maintenance and enhancement of the quality of the environment: (g) any finite characteristics of natural and physical resources: (h) the protection of the habitat of trout and salmon: (i) the effects of climate change: (j) the benefits to be derived from the use and development of renewable energy.	implementation of the consent including the co-design of the overland flow system. Utilisation of the existing WWTP and site as part of the upgraded / new WWTP will result in the efficient use of current resources. The level of adverse effects on stream ecology, relative to the existing environment, will range from negligible to potentially moderate (when considered in combination with other catchment stressors). Further, relative to the current state, the proposed improvements in the treated wastewater quality will result in material improvement to several stream attributes. The expansion of the overland flow system and improvements to the current system provide the opportunity to increase the extent of indigenous flora on the WWTP site. This coupled with the proposed riparian planning and improvement in the wastewater discharge quality should result in the overall enhancement of ecological values at the WWTP site. The proposed wastewater scheme will be designed to be resilient to the effects of climate change and natural hazards.
8 Te Tiriti o Waitangi In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall take into account the principles of the Te Tiriti o Waitangi.	Watercare is continuing to work with Ngāi Tai ki Tāmaki to understand the effects of the treated wastewater discharge to their ancestral landscape, and Te Taiao and is committed to support Ngāi Tai ki Tāmaki as partners in the process following the lodgement of the application.

Based on the information available to date (noting that Ngāi Tai ki Tāmaki is preparing a CIA for the proposal), it is considered that the proposal is generally consistent with Part 2 of the RMA.

13. Engagement and Consultation

Over the past seven months (October 2023 – April 2024), an engagement exercise has taken place to inform and seek feedback from key stakeholders and members of the community including Ngāi Tai ki Tāmaki (as Mana Whenua) to help inform the determination of the BPO for the treated wastewater discharge from the WWTP. The engagement process, activities and responses are set out in the Watercare Stakeholder Engagement Report April 2024 appended to this resource consent application.

Stakeholder engagement on major projects is supported by Watercare's SOI, prepared in accordance with Section 64 and Schedule 8 of the Local Government Act 2002. The SOI outlines the company's strategic direction, activities, intentions and objectives. It reflects Watercare's commitment to engage with mana whenua and affected and interested parties in an open manner to address concerns of those parties where feasible.

13.1 Ngā Iwi Mana Whenua o Tāmaki Makaurau

Watercare regards its relationship with Ngā Iwi Mana Whenua o Tāmaki Makaurau as a collaborative partnership which recognises the local iwi or hapū as kaitiaki or guardians of the land.

Watercare established a Mana Whenua Kaitiaki Forum in 2012 to encourage discussion and guidance between mana whenua and Watercare to share views on the management of water and wastewater issues. The forum's focus has widened so that it now encompasses all Watercare projects affecting the strategic interests of mana whenua across the Auckland region. Watercare has offered each of the mana whenua entities an opportunity to be involved in all projects.

Watercare has kept iwi groups informed of this project through updates to the Kaitiaki Forum, which includes nominated representatives of all 19 mana whenua groups of the Auckland area. Watercare initially added the project to the Mana Whenua Kaitiaki Managers' List in September 2023 under the title "Beachlands Wastewater Treatment Plant Discharge Renewal". The following updates are relevant to this project:

- Ngāi Tai ki Tāmaki registered interest in the project in September 2023

  A summary of how Watercare has been working with Ngāi Tai ki Tāmaki is set out in the Watercare Stakeholder Engagement Report. Watercare is continuing to work with Ngāi Tai ki Tāmaki and this will continue beyond the lodgement of the application.

- Ngaati Te Ata Waiohua communicated with Watercare in mid-December 2023 that they wish to be updated on all projects in their rohe

  Watercare will continue to update Ngāti te Ata as the project progresses.

13.1.1 Ngāi Tai ki Tāmaki Engagement Summary

Engagement with Ngāi Tai ki Tāmaki on the project to date has been set out in the Stakeholder Engagement Report and has included engagement in multiple forms from September 2023 through to lodgement of the application in April 2024.

To date, Ngāti Tai ki Tāmaki have not provided formal input (by way of a cultural statement) on cultural values and potential impacts as they related to the project, however, the general themes of the matters covered during the engagement are set out in section 5 above. Additionally, Ngāi Tai ki Tāmaki has stated their intention to provide a cultural statement which will be progressed following lodgement of this application.

13.2 Project Stages and Engagement

The table below sets out the engagement activities undertaken through the stages of the alternatives assessment process to determine the BPO and through the preparation of the resource consent application.

Table 13-1: Project stages and engagement activities

Project Stage	Stakeholder	Communication	Timing
Long long-list assessment	Internal Watercare Staff & technical specialists		August 2023
	Ngāi Tai ki Tamaki	Meeting and email with Ngāi Tai ki Tāmaki Governance to provide overview of option selection process and timeline.	September 2023
Long list assessment	Mana Whenua	Project Options posted on the Mana Whenua Kaitiaki Forum.	October 2023
	Wider community	Direct Email to 2660 email addresses on database. Community Information Session 1. Online survey.	October 2023
Short list assessment	Ngāi Tai ki Tāmaki	Representatives present at the two Short List Workshops	November and December 2023
	Wider community	Direct Email to 2660 email addresses on database. Advertisement on Pohutukawa Coast newspaper. Social Media post on Pohutukawa Coast Grapevine and Maraetai Group. Community Information Session 2.	November 2023
	Key Stakeholders	Where offer to meet was accepted, individual meetings held with stakeholders to go through the 5 Short-List options and the options process to date.	November 2023
	Potentially Affected Landowners	Letters sent directly to affected landowners. Community Information Session 2.	November 2023
BPO Preferred Scheme	Potentially affected landowners	Email and letter sent directly to landowners.	March 2024
	Interested parties	Email sent directly to interested parties registered on the contact list.	March 2024
	Wider community	Update Watercare website for the Beachlands project .	March 2024
	Mana Whenua	Direct email to Ngāti Tai ki Tāmaki. Update Mana Whenua Kaitiaki Forum.	February 2024 February 2024
Prepare Resource Consent	Ngāi Tai ki Tāmaki	Mana Whenua preparation of a Cultural Impact/Values Assessment.	Ongoing
	Potentially affected landowners	N/A as Watercare is the landowner for the WWTP	N/A
	Wider community and stakeholders	Public notification of the consent application. Opportunity to provide a submission on the consent application.	TBC following lodgement

13.3 Stakeholders

13.3.1 Local Board

Watercare, through its dedicated Stakeholder Liaison team, has undertaken direct engagement with central government, Auckland Council, and the Franklin Local Board. A summary of this engagement is set out in the Watercare Stakeholder Engagement Report.

13.3.2 Key Stakeholders

A range of stakeholders with diverse interests and influence have been involved in the project. The level of engagement with these groups varied depending on the stakeholder and their interest. Key stakeholders engaged with by Watercare to date are:

- Environmental Defence Society
- Hauraki Gulf Forum
- Auckland Regional Public Health

Through the process, the project team communicated with local interested individuals, as they became involved during the process. People would either request to be sent information following a newsletter, respond via Watercare's website or would leave their contact details at a Community Information Session.

13.3.3 Potentially Affected Landowners

Ahead of the Community Information Session on the short-listed options (Session 2), 22 potentially affected landowners were contacted to notifying them that their land would be potentially affected if the final BPO was the land application discharge method. The notice invited parties to attend the Community Information Session 2 and provided a direct contact person for any queries on the proposed options. A number of potentially affected landowners contacted Watercare directly. A summary of the feedback from the potential affected landowners was:

- Concerns over the acquisition of land for the discharge purposes
- Questions around how landowners would be compensated if the preferred option required their land
- Requests to be updated as the BPO decision process progresses.

13.3.4 Public and Community Interests

At various stages of the project, community groups, businesses and the wider community were engaged, including the Pohutukawa Coast newspaper and the Maraetai social media Groups.

Groups were primarily kept informed through social media, email updates, the Watercare website and community letters. The main opportunity for people to provide feedback to Watercare on the option selection process was through Community Information Sessions and the online survey. The feedback channel on the Watercare Beachlands webpage was also open through a dedicated email address that was monitored by the project team.

13.4 Engagement Activities

13.4.1 Community Information Session 1

Local businesses within the area were contacted on 17 October 2023 via hand-delivered invitation posters and flyers for the Beachlands Community Information Session 1 which were delivered to local shops, kindergartens, restaurants and cafes. The wider community was also contacted on 20 October 2023, via emails sent to the database of approximately 2660 email addresses for the wider community inviting them to the Beachlands Information Session 1, with information on the long-list of options and a survey link which enabled feedback on the long-list options.

The Community Information Session 1 was held on 26 October 2023 at Te Puru Community Centre, a local well-resourced venue, to discuss the long-list options. A total of 13 community members volunteered their contact details a higher number attended the event.

13.4.2 Online Survey

As part of the initial community wide email to the database of 2660 community email addresses, an online survey link was sent for the community to fill out, to help Watercare better understand the community concerns of the suggested options. A total of 61 respondents started the survey, with 23 respondents completing the survey and 38 respondents partially completing it.

13.4.3 Community Information Session 2

On 13 November 2023 direct emails were sent to the database of 2660 community email addresses and social media posts in the Pohutukawa Coast Grapevine and Maraetai Group were made that invited the community to the Community Information Session 2. Follow-up reminder emails were sent and social media posts made on 21 November 2023. On 17 November 2023, Watercare also published an ad and public notice in the Pohutukawa Coast newspaper advertising for the Community Information Session 2.

The Community Information Session 2 was held on 22 November 2023 to discuss the five Short-List options. A total of 13 community members volunteered their contact details however, a higher number attended the event. By way of summary, a mixed response was received in terms of what parties considered the BPO to be for the discharge of treated wastewater.

13.4.4 Website

The 'Projects around Auckland' section on Watercare's website houses specific web pages on current and proposed infrastructure projects that Watercare is involved in. The web page designated to the Beachlands WWTP discharge consent renewal[37] contains an overview of the project, a description of the alternatives process, maps and option description. The web page was progressively updated as the BPO process was advanced.

13.5 Responses

Feedback from the community on the various wastewater management options is summarised in the Watercare Stakeholder Engagement Report.

[37] Watercare - Beachlands WWTP discharge consent renewal

14. Conclusions

Watercare is seeking to replace the current consent it holds for the discharge of treated wastewater from the WWTP. The current discharge consent expires on 31 December 2025.

The current consent has a maximum daily discharge volume limit of 2,800m³/day. Like much of Auckland, the catchment of the Beachlands WWTP is subject to significant growth which is placing pressure on the capacity of the WWTP and the consent limits. In addition, the current WWTP is coming to the end of its design life and several components need to be upgraded or replaced.

The proposal will enable the servicing of future growth including a recently allowed plan change and a proposed business park. Both these developments originally included individual wastewater treatment and discharge solutions. This application will enable the reticulation of the wastewater from these new developments to the WWTP for treatment and discharge. It will result in only one discharge to the environment, rather than three, and ensure the consistent and effective management of the community's wastewater by a highly competent and experienced operator.

The proposal is to undertake a short term (interim) upgrade to the WWTP to manage the increased flows to the plant and then to ultimately replace the current WWTP with a new MBR plant to improve treatment levels. The timing of the new WWTP is population driven. The new plant will need to be commissioned by the time a population equivalent (PE) of 18,000 is reached. The new WWTP is designed to provide for a PE of 30,000 by the end of the consent term sought of 35 years. The new MBR WWTP will raise the level of treatment of wastewater from the Beachlands and Maraitai communities to the very high standard that Watercare provides elsewhere in Auckland.

The treated wastewater will continue to be discharged via an overland flow system to the current farm pond which is located within a tributary of the Te Puru Stream. The overland flow system will need to be expanded to accommodate the increase in flows. The current farm pond may need to be upgraded or a wetland developed to receive the increase in the discharge.

A comprehensive suite of technical investigations and assessments have been undertaken to support the resource consent application. The conclusions from these assessments are summarised in Section 11.

A range of positive effects will also arise from operation of the WWTP, of which the wastewater discharge is part, associated with the provision of a safe and reliable public health sanitation system for the community, treating wastewater to ensure good ecological health outcomes, the facilitations of future development within the community.

The assessments identify that potential adverse effects may arise with respect to the overland flow area, Te Puru Stream and the coastal marine area. It is anticipated that these adverse effects will range from negligible to potentially moderate.

The detailed statutory assessment completed for this application concludes that the proposal is generally consistent with the relevant planning instruments and Part 2 of the RMA. It further concludes that none of the adverse effects identified in section 107 (1) (c) to (g) of the RMA are likely to occur as a result of the proposed discharge.

Watercare has proposed a range of management, mitigation and monitoring measures that it considers will ensure the proposal and its effects are appropriately managed and monitored over the 35 year consent term being sought. In addition, Watercare is continuing to work with Ngāi Tai ki Tāmaki to understand the effects of the treated wastewater discharge on Te Taiao and the Ngāi Tai ki Tāmaki connection to Te Taiao, and to develop additional mitigations and remedies to assist in addressing these effects.

For these reasons Watercare considers that the discharge permit should be granted for period of 35 years and subject to conditions reflecting the measures proposed in section 10 of this application.

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